

Can Intensive Wilderness Programs be a Catalyst for Positive
Change for Young People at Risk of Future Offending,
Educational Disengagement or Poor Wellbeing?

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Abstract

This study systematically operationalised and then assessed the following research question: Can intensive wilderness programs be a catalyst for positive change for young people at risk of future offending, educational disengagement or poor wellbeing? The conceptual organisation of the study was informed by the positive youth development literature, with the evaluation framework underpinning the main study categorised by a positive psychology model titled Life Buoyancy. While program marketers and evaluators widely describe wilderness programs as a “catalyst for change”, this construct has not been systematically assessed within the literature. The study operationalised this catalyst descriptor through the Transtheoretical Model (TM; Prochaska, Di Clemente, & Norcross, 1992).

The research included the design (including expert engagement), piloting (n = 71) and validation (n = 503) of a matched youth- and teacher-report tool titled the Behaviour Change Questionnaire (BCQ). The BCQ’s rating scale operationalised the motivational dimensions of the TM, with the content restricted to student behaviours indicative of educational disengagement within mainstream educational settings. The BCQ was included within a quasi-experimental evaluation (pretest posttest follow-up design) of Operation Flinders, an Australian-based wilderness program for male and female young people aged between 13 and 17. The evaluation included youth- and teacher-report measures predictive of (1) offending (e.g., aggressive impulses, antisocial cognitions, attitudes to police), (2) educational disengagement (e.g., classroom behaviour and self-esteem, attitudes to teachers, educational risk taking, motivation to change) and (3) wellbeing (e.g., future aspirations, optimism, self-efficacy, self-esteem, intrinsic and extrinsic value orientation, satisfaction with life). Longer-term outcome trends were assessed through electronically coded behavioural measures (e.g., school explained and unexplained absences, attendance, suspension/exclusion data).

To answer the research question, propensity score matching (PSM) was applied to match treatment (n = 345) and control groups (n = 209) across the measured covariates (n = 71) and address non-equivalence in the control group. PSM models (each with 20 multiple imputed data sets) were developed for: (1) the entire sample (matching with replacement), (2) entire sample (matching without replacement), (3) offending risk group (matching with replacement), (4) educational disengagement risk group (matching with replacement), and (5) poor wellbeing risk group (matching with replacement).

Across all groups, Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on short-term measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing, motivation to change and problem awareness. The most consistent pattern of program effects was for participants at the highest risk of future offending. Small but non-significant effects for this cohort clustered most strongly on the behavioural outcomes, with longer-term outcomes trending in a similar direction. The study found no consistent evidence for program attendance and increased motivation to change. Emerging evidence suggested that there may be a complex relationship between motivation to change and participant risk profile and behavioural type.

While the study does not offer strong empirical support for the use of the “catalyst for change” descriptor, the heuristic and applied value of the descriptor remains supported.

Declaration

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or a diploma in any university, and that to the best of my knowledge and belief it does not contain any material previously published or written by another person where due reference is not made in the text.

Ivan John Raymond

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Terminology

- In this thesis the term “Aboriginal” is used to refer to people of Aboriginal or Torres Strait Islander descent. Where reference is made to published material in which the term “Indigenous” is used, the same terminology is adopted.
- The term “researcher” refers to Mr Ivan Raymond.
- The term “supervisory team” collectively refers to Professor Larry Owens, Associate Professor David Curtis and Dr Neil Welch.
- The term “expert panel” collectively refers to individuals who consented to provide advice and information to guide the development of the evaluation methodology, instruments and data analysis.
- The term “Operation Flinders leadership” collectively refers to Mr John Shepherd (AM), Mr John van Ruth, Ms Kylie Pointon, Mr Jonathon Robran and the designated manager (titled Exercise Commander) responsible for young people on an individual Operation Flinders program.
- The term “referral agency” collectively refers to schools, government and non-government agencies that recruit, screen and support groups of young people to attend the Operation Flinders program.
- The term “intensive wilderness programming” refers to a clearly defined and structured group-based program that is delivered within a remote or wilderness area, that is experienced by the participants as both physically and psychologically demanding.

- The terms “young person/young people” collectively refers to children and young people aged between 12 and 18 years of age.
- The term “research” collectively refers to the three separate studies that were conducted to answer the research question and hypotheses within this thesis.
- The term “pilot study” refers to the piloting and exploratory validation of the Behaviour Change Questionnaire (Youth- and Teacher-Report) undertaken in August 2012.
- The term “main study” refers to the quasi-experimental pretest posttest follow-up design or program evaluation that occurred over five distinct waves from March to September in 2013.
- The term “follow-up study” refers to the collation of electronically coded behavioural, attendance and achievement data provided by the South Australian Department of Education and Child Development.
- The term “youth-at-risk” refers to young people that present with risk factors predictive of future offending, educational disengagement or poor wellbeing.
- The term “static risk factors” refers to demographic (e.g., age, race, gender, SES), behavioural (e.g., offence or suspension history) or other factors that are not amenable to change through intervention, but have a predictive relationship with future offending, educational engagement or wellbeing.
- The term “key liaison person” denotes the individual embedded with the school or referral agency who supported the local implementation of the research.

Abbreviations

BCQ	Behaviour Change Questionnaire
CFA	Confirmatory Factor Analysis
EFA	Exploratory Factor Analysis
MI	Multiple Imputation
MTC	Motivation to Change
PSM	Propensity Score Matching
PYD	Positive Youth Development
RCT	Randomised Control Trial
RMSEA	Root Mean Square Error of Approximation
SA	South Australia
SES	Socio-Economic Status
TM	Transtheoretical Model
TRP	Teacher Reported Problem
YPA	Youth Problem Awareness
YRB	Youth Reported Behaviour
YRP	Youth Reported Problem

Chapter 1

1 Research Context, Question and Structure

This chapter briefly summarises the context and parameters of the research area, and details both the research question and processes, and how the research was structured and organised to answer the question.

1.1 Defining the Context and Problem

The developmental transition of adolescence is changing (Lyons, Huebner, Hills, & Van Horn, 2013). Sawyer et al. (2012) reported:

The present generation of young people will take a different path through adolescence from previous generations and will face new challenges to their health and wellbeing. How they negotiate these years will have a powerful effect on their future health and their countries' economic and social prospects. (p. 1630)

Sawyer et al. suggested that there is a need for greater international attention to programs, policy and research relating to adolescence. The authors argued that over the past 50 years the health of young people has improved substantially less than that of younger children. Despite this, young people, in comparison to older groups, are a healthy and productive cohort (Begg, Vos, Barker, Stevenson, & Lopez, 2007). However, the psychological and behavioural functioning of young people is notably heterogeneous across communities and nations (Kieling et al., 2011; Patton et al., 2012). Mental health problems represent the highest burden of disease in young people (Begg et al., 2007). One in four Australian youth aged 16 to 24 experienced a mental health disorder (anxiety, affective or substance use disorder) within a 12 month period (AIHW, 2011). In terms of youth offending patterns, Australian figures indicated that one in 385 young people aged from 10 to 17 were on a youth justice supervision order on any given day in 2011 (AIHW, 2014). Furthermore, as young people transition into high school, there is up to a 7% decline in school attendance rates from the

period Year 7 to Year 10 (Australian Curriculum Assessment and Reporting Authority, 2013), with approximately 20% of Australian young people not completing Year 12¹ or an equivalent educational milestone (Australian Bureau of Statistics [ABS], 2011).

In short, adolescence has the potential to be a period of both vulnerability and opportunity. Developmental trajectories initiated or consolidated in this period may extend into adulthood and have significant individual and collective impact (positive or negative). Young people with histories of offending, school disengagement or mental health problems (or poor wellbeing) are at higher risk of developing psychological or behavioural disturbances in adulthood, and becoming disengaged from work and social institutions (Finn & Zimmer, 2012; Henry, Knight, & Thornberry, 2012). The social and economic cost of these trajectories on both individuals (Heckman, 2008) and entire nations (Viner et al., 2012) remains significant.

At a national level, the Australian Government has sought to optimise the social and emotional development of young people (AIHW, 2012), and increase high school completion rates (COAG, 2009; Lamb, 2011). However, government funded agencies delivering programs to young people are increasingly being required to show evidence of the effectiveness of their interventions (Head, 2008), with program evaluation and benchmarking a pre-requisite for some government funding (Australian Government, 2009).

In summary, there is significant public and policy interest in the design and implementation of interventions that can positively moderate a young person's developmental trajectory towards future offending (Crowley, 2013; Deković et al., 2011), educational disengagement (Heckman, 2008) or poor health and wellbeing outcomes (Hamilton & Redmond, 2010). With this context in mind, this research systematically evaluates the efficacy of a brief intensive wilderness program to influence the psychological and

¹ Year 12 is the final year of high school or secondary education within Australia.

behavioural trajectories of young people at risk of offending, educational disengagement or poor wellbeing. It responds to a research gap to identify optimal programming and policy settings underpinning young people's transition into adulthood (Patel, Flisher, Hetrick, & McGorry, 2007).

1.2 Wilderness-Adventure Programs as an Intervention Modality

At the broadest level, wilderness-adventure programs involve participants being engaged within an outdoor or wilderness setting, and undertaking a range of hands-on or experiential activities that are designed to evoke positive change or psychological growth (Davis-Berman & Berman, 1994b; Gass, 1993b). Specifically, the intervention seeks to “kinesthetically engage clients on cognitive, affective and behavioural levels” (Gass, Gillis, & Russell, 2012, p. 1). While evidence indicates that the intervention can deliver meaningful offending, educational and wellbeing outcomes (Bedard, Rosen, & Vacha-Haase, 2003; Bowen & Neill, 2013; Wilson & Lipsey, 2000), the widespread application of the modality appears largely driven by intuitive appeal, as opposed to robust research and empirical validation (Heseltine, Mohr, & Howells, 2003). Within the wilderness-adventure literature there is a paucity of methodologically sound process and outcome evaluations (Russell & Farnum, 2004). The forensic literature, that brings strong evidence to the design and evaluation of offender interventions (Andrews & Bonta, 2010a), provides only limited support for the utility of wilderness interventions as either a crime prevention (Sallybanks, 2003) or offender rehabilitation strategy (Castellano & Soderstrom, 1992).

Despite this, as detailed within Chapter 3, wholesale generalisations regarding the effectiveness (or lack of effectiveness) of intensive wilderness programs within Australia are not supported (Raymond & Lappin, 2015). Instead, given the heterogeneity of programs, it is argued that program effectiveness can only be judged on a case-by-case basis through independent evaluation (Raymond, 2014). A common summary narrative communicated by

evaluators and program marketers is that wilderness programs are a “catalyst for change”. For example, following two evaluations of the Operation Flinders wilderness program, Raymond (2004) concluded that the program “provides a ‘window of opportunity’, or catalyst for change, by which young people can be engaged and sustained within a therapeutically conducive environment that is advantageous to future positive outcomes” (p. 7). A similar evaluation narrative was also provided by Raymond and Lappin (2011) following their evaluation of three intensive wilderness programs in the Northern Territory (Australia). Despite the “catalyst for change” narrative also appearing within multiple online marketing descriptors of wilderness programs, both within Australia and internationally (see Table 3.1, Chapter 3), the construct has not been systematically operationalised, nor assessed, within the literature. In addition, the validity of the descriptor for young people from diverse backgrounds and risk profiles (e.g., offending, educational disengagement or poor wellbeing) is uncertain. Therefore, the foundational aim of the research is to systematically explore and assess the utility of the descriptor “catalyst for change” as it relates to intensive wilderness programming for young people at risk of negative future outcomes. Specifically, the thesis set out to answer the following core research question:

Can intensive wilderness programs be a catalyst for positive change for young people at risk of offending, educational disengagement or poor wellbeing?

This question was answered through a pretest-posttest follow-up design (with matched control group) evaluation of the Operation Flinders wilderness-adventure program delivered in South Australia. The research included the design, development and validation of an instrument operationalising this “catalytic” descriptor (titled Behaviour Change Questionnaire). The operationalisation of the research question and methodology are briefly summarised in the following sections.

1.3 Thesis Structure, Organisation and Summary Content

Six constructs articulated within the research question were systematically examined within this research. These are:

1. The operationalisation of the term “*intensive wilderness program*”, and the critical review of the empirical and conceptual evidence for the modality’s utility for youth at risk of offending, educational disengagement or poor wellbeing.
2. The operationalisation of the terms “*offending*”, “*educational engagement*” and “*wellbeing*”.
3. The conceptual and psychometric operationalisation of the term “*catalyst*”.
4. The development and implementation of a methodologically sound framework and research method to assess “*change*”.
5. The operationalisation of the term “*positive*” within a youth development body of literature.
6. The operationalisation of “*risk*” as it relates to future offending, educational disengagement and poor wellbeing outcomes in young people.

This research brings significant attention to all six constructs, and the content has been layered and organised to address the research question. This layered organisation is graphically represented in Figure 1.1, with the content mapped to each layer briefly summarised in the following sections of this chapter.

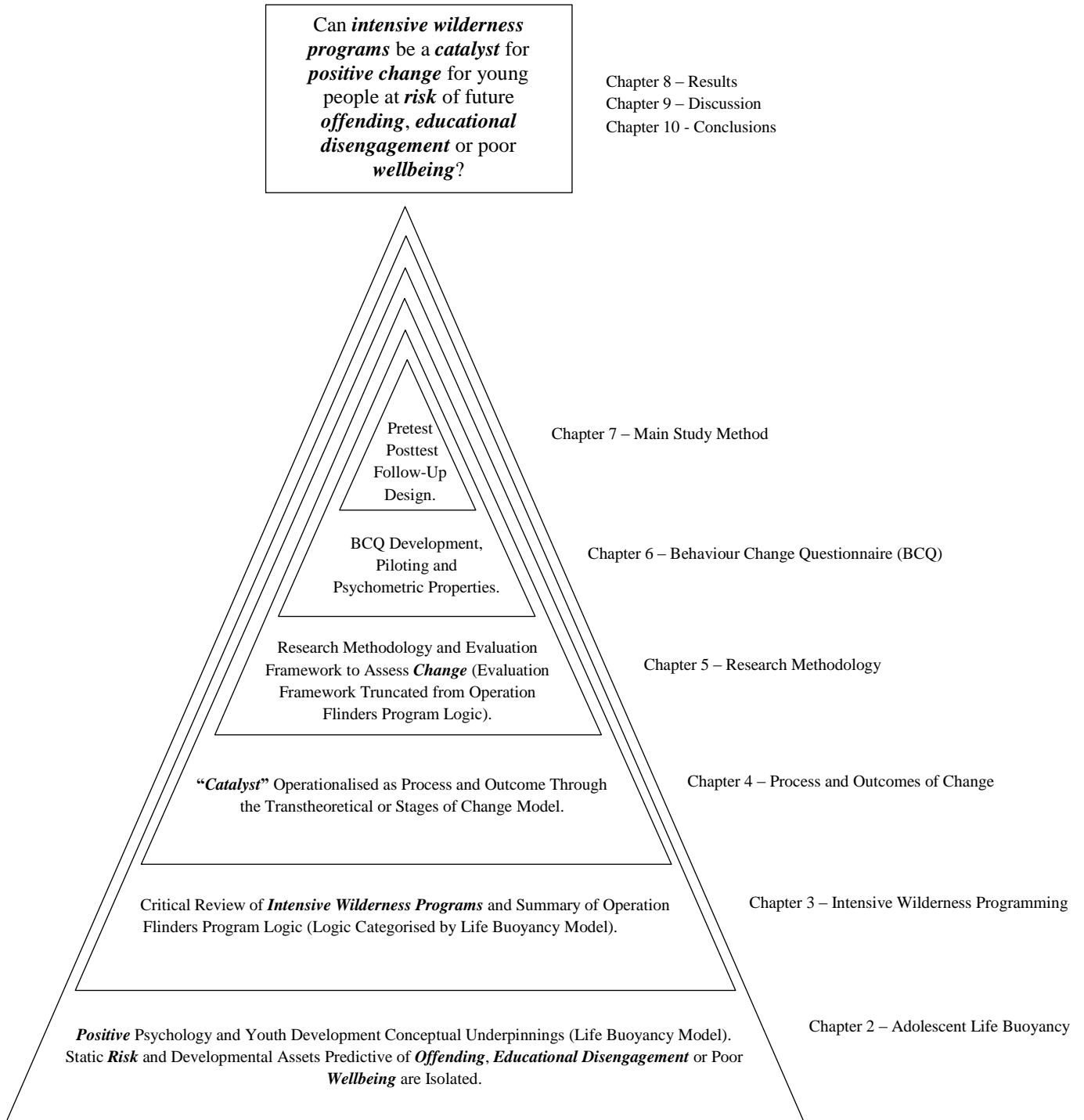


Figure 1.1 Thesis conceptual and structural organisation

1.3.1 Adolescent Life Buoyancy (Chapter 2)

As per Figure 1.1, at its foundations, the research is conceptually framed and empirically informed by the positive psychology and youth development literature, specific to future offending, educational engagement or wellbeing outcomes for young people. This is explained as follows. While the period of adolescence has been traditionally characterised as a period of “storm and stress” (Hall, 1904), developmental psychologists have challenged the universality of the “storm and stress” construct (Arnett, 1999; Hollenstein & Loughheed, 2013), and it is widely agreed that adolescence should be understood through multi-systemic or ecological approaches (Bowers et al., 2011; Bronfenbrenner & Ceci, 1994; Hollenstein & Loughheed, 2013). The increasing move away from deficit or problem-focused understanding of adolescence has also brought research interest to the “positive” or strength-based qualities underpinning this developmental transition. This has coincided with a broader psychological movement towards “positive psychology” (Seligman & Csikszentmihalyi, 2000), and has been operationalised by American developmental psychologists and researchers as “positive youth development” (PYD; Larson, 2000; Lerner, Dowling, & Anderson, 2003). Volume 34 of the *Journal of Adolescence* was recently devoted to this ecological model, which can be briefly summarised as follows:

...the combined role of characteristics of the person and ecological assets in the family, school, or community settings of youth to promote the development of PYD. (Lerner, Lerner, von Eye, Bowers, & Lewin-Bizan, 2011, p. 1107)

This strength-based model brings a strong focus to growing the “assets” of adolescents to “thrive” or achieve optimal wellbeing and be healthy and productive (King et al., 2005; Lerner et al., 2003; Lerner, Lerner, von Eye, et al., 2011). Applying these constructs, the research question could be reframed as follows: “Can intensive wilderness programs grow the developmental *assets* that reduce a young person’s risk for future offending, educational disengagement or poor wellbeing?”

This research restricts itself to examining the *proximal* or developmental assets (e.g., skills, attitudes, values and/or behavioural traits) that increase a young person's capacity to engage optimally with *distal* ecological variables (e.g., school, parents, teacher, community) that have been empirically shown to manifest in positive behavioural (e.g., reduced offending), educational engagement and wellbeing outcomes. It is acknowledged, however, that these outcomes are dependent on the interaction between both proximal and distal factors (Lerner et al., 2005; Lerner, Lerner, von Eye, et al., 2011), and given the restricted analysis, this remains a limitation of the research.

Chapter 2 provides a detailed summary of the “developmental assets” that are empirically and conceptually related to reduced offending risk, improved educational engagement and enhanced wellbeing outcomes in young people. All three constructs are operationalised and defined within Chapter 2. This chapter also details the static risk factors that are predictive of offending, educational disengagement and poor wellbeing. The term static risk has been adapted from the forensic psychology literature (Andrews & Bonta, 2010a) and includes demographic (e.g., age, race, gender, SES), behavioural (e.g., offence or suspension history) or other factors that are not amenable to change through intervention, but have a predictive relationship with future outcomes. In Chapter 7, the outcome analyses are stratified for young people at risk of (1) offending, (2) educational disengagement and (3) poor wellbeing. Key static risk factors identified in Chapter 2 were applied to operationalise this stratification process.

This research brings strong attention to the best-practice design, implementation and evaluation of youth programming (e.g., Mertens & Wilson, 2012; Royse, Thyer, Padgett, & Logan, 2010). Chapter 2 identifies five best-practice considerations for the development and implementation of “asset building” programs for young people. They include: (1) conceptually sound, (2) responsive, (3) program integrity, (4) skill-focused and (5) targeted.

These five principles are drawn upon throughout this research. Chapter 10 reviews the Operation Flinders program against these principles, and provides program development recommendations to strengthen program impact. To support the implementation of these principles, the author has developed the Life Buoyancy Model. The Life Buoyancy Model is a strength-based model to bring together both short-term (e.g., awareness, skills and mindset) and medium-term (e.g., engagement and wellbeing) outcomes within a cohesive categorising or conceptual framework that can be applied across offending, educational and wellbeing settings. Chapter 2 provides a brief summary of the Life Buoyancy Model.

1.3.2 Intensive Wilderness Programs (Chapter 3)

Chapter 3 provides a critical review of the descriptive, conceptual and empirical underpinnings of wilderness-adventure programs for youth-at-risk. Many wilderness-adventure programs are developed in response to an individual's or organising body's vision, community needs, funding criteria and environmental location (Raymond & Lappin, 2011). As such, wilderness programs are notably heterogeneous in nature, and this diversity is reflected in program: (1) description and operationalisation, (2) composition or structure (e.g., length, intensity), (3) conceptual or theoretical underpinnings, (4) inclusion of additional therapeutic enhancement strategies, and (5) intervention cohort. This heterogeneity is detailed in Chapter 3. This research restricts itself to the examination of "intensive wilderness programs"; defined by the author as:

A clearly defined and structured group-based program that is delivered within a remote or wilderness area which is experienced by the participants as both physically and psychological demanding (or intense in nature).

Chapter 3 details a critical review of the empirical and conceptual evidence for the wilderness-adventure discipline's utility for young people at risk of offending, educational disengagement or poor wellbeing. Meta-analytic studies support the effectiveness of

wilderness-adventure programs to deliver short-term offending, educational adjustment and wellbeing outcomes (Bedard, 2004; Bowen & Neill, 2013; Cason & Gillis, 1994; Hattie, Marsh, Neill, & Richards, 1997; Wilson & Lipsey, 2000). Chapter 3 indicates that there are a number of questions regarding outcome sustainability within the wilderness-adventure literature. In other words, wilderness-adventure programs may elicit but not consolidate change, thus they could be described as having a catalytic effect. The “catalyst for change” descriptor frequently appears in both journal and program marketing documentation related to wilderness-adventure programs. Chapter 3 summarises the descriptive and empirical evidence currently supporting the use of the “catalyst for change” descriptor within the wilderness-adventure literature.

Chapter 3 also provides a descriptive summary of the Operation Flinders program. The intervention is a brief intensive wilderness program for male and female young people (aged between 13 and 17) at risk of future offending, educational disengagement and poor future wellbeing. The eight-day intervention involves small groups of young people (8 to 10) walking approximately 100km over undulating and remote terrain in the northern Flinders Ranges, South Australia, approximately 550km from the metropolitan capital, Adelaide. The program is designed as a psychologically and physically intense stand-alone intervention designed to foster “personal attitudes of self-esteem, leadership, motivation, team work and responsibility”². The Operation Flinders program was developed in 1992 from a founder’s vision, but has grown organically in response to participant, stakeholder and funder needs (a detailed program overview is provided in Chapter 3).

Throughout this research, a strong focus is brought to best-practice program design, implementation and evaluation. The development of conceptually sound program models, that systematically describe wilderness-adventure program processes and outcomes, remains

² Operation Flinders Mission Statement. Retrieved from <http://www.operationflinders.org.au/AboutUs/Aims.aspx> (dated 16/1/2014)

a best-practice consideration (Norton et al., 2014). At the point of research planning, the Operation Flinders program had no clearly conceptualised program model (or program logic/theory) that described the relationship between program processes and outcomes. A framework that systematically describes a program's processes and outcomes is logic modelling (Cooksy, Gill, & Kelly, 2001; Jordan, 2013). The Life Buoyancy Model (briefly introduced in Chapter 2) was applied to inform the design, categorisation and articulation of a program logic model underpinning the Operation Flinders wilderness program (Raymond & Lappin, 2015). Chapter 3 reproduces the Operation Flinders program logic. This research makes no attempt to systematically test or validate either the Life Buoyancy Model or the Operation Flinders program logic. Instead, these frameworks are provided to support the organisation of the short- and medium-term outcome measures applied within this research, and contextualise the research within a positive psychology conceptual framework (Life Buoyancy Model). A truncated version of the Operation Flinders program logic was used to categorise and organise the evaluation framework underpinning the main study. This evaluation framework is provided in Chapter 5 (Table 5.1).

1.3.3 Process and Outcome of Change (Chapter 4)

The “catalyst” descriptor is defined and operationalised in Chapter 4. At the broadest level, the Collins Concise Dictionary (1998) defines “catalyst” as follows:

Noun – 1. a substance that increases the rate of a chemical reaction without itself suffering any permanent chemical change. 2. a person or thing that causes a change.

These definitions, applied to the construct of change, suggest that the term catalyst describes both trigger for actual change (outcome), and the process of supporting change. Applying this definition (and detailed in Chapter 4), this research operationalises change as both a process and an outcome. To illustrate, consider an individual whose desired change is to reduce their weight. The loss of weight represents an endpoint outcome, however,

undertaking exercise and reducing food intake are important change processes in their own right. While the latter remains predictive of the outcome (loss of weight), even if the endpoint is not achieved, the presence of these change processes are important markers and intermediate outcomes. Within the behaviour change literature, the Transtheoretical Model (TM) operationalises change as both a process and outcome (Prochaska, Di Clemente, & Norcross, 1992). This model has been applied to match therapeutic interventions to an individual's readiness to change, including smoking cessation (Cahill, Lancaster, & Green, 2010), offender rehabilitation (Casey, Day, Howells, & Ward, 2007; Day, Bryan, Davey, & Casey, 2006) and child and adolescent obesity (Cobb, 2011).

Chapter 4 provides a detailed review of the applications of the TM across offending, educational and wellbeing settings. Of interest to this research, the TM was applied to qualitatively describe the utility of three intensive wilderness programs for youth-at-risk (Raymond & Lappin, 2011). It has also been operationalised as a program theory for the development of an intensive wilderness intervention (Raymond & Lappin, 2015). Raymond and Lappin (2011) reported that the framework appeared to offer promise to understand the utility of intensive wilderness programs. The current research draws upon this and follow-up exploratory studies (Pointon, 2011; Raymond & Lappin, 2015), but with a quantitative operationalisation and assessment of the construct. A number of assessment instruments based upon the TM were reviewed for inclusion within this research, including their utility for young people presenting with diverse risk profiles related to offending, educational disengagement and poor wellbeing. Following this review, it became apparent that there were no validated instruments that could be implemented within educational contexts, or applicable to the participant cohort and, for this reason, a specific instrument would need to be created. In short, an important outcome of the research was to construct and validate a process and outcome measure of change based upon the TM, and then integrate this

instrument within an outcome evaluation of the Operation Flinders wilderness program.

Chapter 4 provides a critical review of the TM, and details three central tool development considerations that were brought to the design of the Behaviour Change Questionnaire (BCQ) in Chapter 6.

1.3.4 Research Methodology (Chapter 5)

The research question required the identification and implementation of a methodologically robust method to assess “change”. Chapter 5 provides a detailed review of the operationalisation and assessment of change (change science), including a summary of key threats to internal and external validity within program evaluation. The chapter reviews the randomised control trial (RCT) as the gold-standard benchmark to assess change, and statistical power as an important consideration within evaluation.

While the research was benchmarked against the RCT design, its implementation was constrained by a number of program and participant related factors. First, participant referrals to the Operation Flinders program occurred through schools or youth agencies that nominated and supported groups to undertake the program at the start of the calendar year. At the time of the research, the selection criteria for the Operation Flinders program were young men and women, aged between 13 and 17, who were “identified as being at risk”. It was noted that risk was operationalised individually by referral agencies, and was likely to include factors related to offending, family and social problems, educational disengagement and low self-worth or confidence. The research design had to consider a heterogeneous participant group, originating from metropolitan and remote South Australia, likely to present with lower levels of literacy and higher distrust towards evaluation, and presenting with unique risk factors related to offending, educational disengagement and poor wellbeing. Second, as detailed in Chapter 5, owing to both ethical and referral agency constraints, the conditions for randomisation were found not to exist. Finally, as schools were the central

point of referral for the Operation Flinders program, the implementation of the research had to be embedded within educational settings.

Based upon these constraints, the research question was answered through a quasi-experimental pretest posttest follow-up design. Youth- and teacher-report measures, related to participants and matched control group members, were completed prior to the intervention (pretest) and 6 to 8 weeks post-intervention (posttest). This occurred over five program waves between March and September 2013 and, within this research, this data collection process is referred as the *main study*. Electronically coded educational achievement, behavioural and attendance data were provided by the South Australian Department of Education and Child Development approximately 12 months post-program for the majority of program and control participants, and within this research, this data collection is referred to as the *follow-up study*. An important outcome of this research was the design, piloting and validation of an instrument operationalising the construct of “catalyst” as informed by the TM. An instrument titled the Behaviour Change Questionnaire (Youth- and Teacher-Report) was developed in 2012, with piloting and exploratory validation occurring in September 2012. The data collection related to the piloting of the BCQ is referred as the *pilot study* within this thesis.

Chapter 5 provides a detailed summary of the rationale and considerations that informed the research design across the *pilot*, *main* and *follow-up* studies. This includes the: (1) identification and use of the psychometric instruments, (2) application and inclusion of youth- and teacher-report measures, (3) period for pre- and post-testing, (4) sampling method, (5) participant stratification of risk and (6) ethical considerations. The descriptive and procedural implementation of the research design through the pilot study is provided in Chapter 6, while the method specific to the main and follow-up studies is provided in Chapter 7.

Evaluation scientists are increasingly interested in employing frameworks to guide the design and implementation of program evaluations (Sridharan & Nakaima, 2011). Chapter 5 provides an evaluation framework (Table 5.1) that was developed in consideration of the Operation Flinders program logic, which itself was informed by the Life Buoyancy Model (Chapter 2). The evaluation framework summarises the short- and medium term outcomes (dependent variables) and the static risk factors assessed in the main study. The categorisation and development of the evaluation framework, as appearing in Chapter 5, is summarised in Figure 1.2.

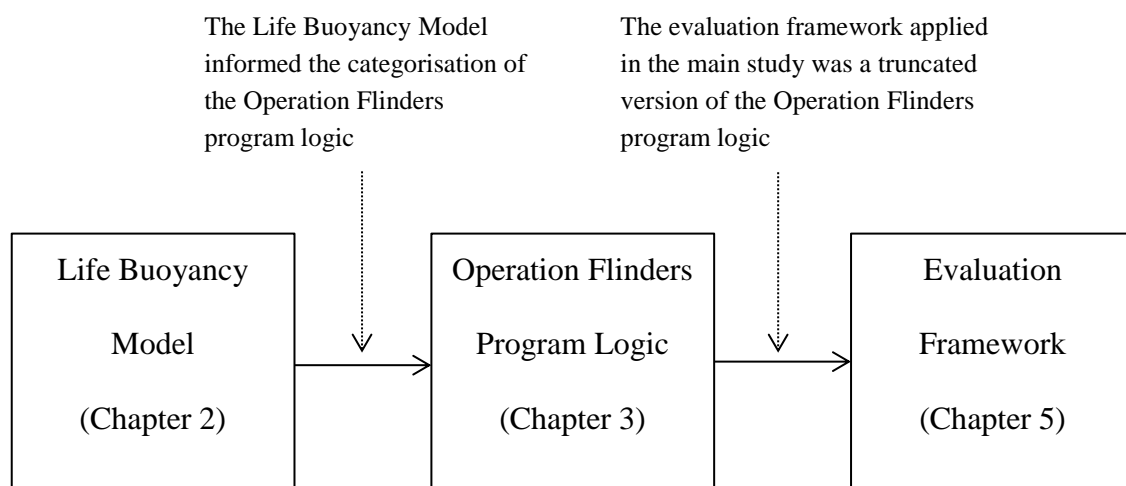


Figure 1.2 Conceptual development of the evaluation framework

As represented in Figure 1.2, a background aim of this research was to demonstrate how positive psychology constructs and modelling can be operationalised across both program development and evaluation. This is provided as a background case study only, and no attempt is made to evaluate the utility of this operationalisation within this research.

1.3.5 Behaviour Change Questionnaire (BCQ) (Chapter 6)

Chapter 6 is dedicated to describing the development, piloting and psychometric assessment of the Behaviour Change Questionnaire (BCQ; Youth- and Teacher-Report); an

instrument operationalising the process and outcomes of change. The start of this chapter details the significant challenges that existed in developing a tool that assesses motivation to change for a multidimensional construct like educational engagement, and where an independent assessment of whether or not a behaviour represents a “problem” is required to be undertaken. The chapter notes that the assessment of motivation to change specific to the broad construct of educational disengagement introduces potential confounds between motivation and behavioural type.

The BCQ was developed and refined through construct mapping, expert review of item and scale design, and piloting. Matched youth- and teacher-report instruments included an 18-item checklist of behaviours indicative of educational disengagement, and a rating scale mapped to the TM (Prochaska et al., 1992). Collectively, the youth- and teacher-report BCQ was designed to assess: (1) a student’s recognition of aggressive, conduct and avoidant behaviours (defined as youth reported behaviour; YRB), (2) a student’s level of problem awareness (defined as youth problem awareness; YPA), (3) a student’s motivation for self-directed change within educational settings (defined as motivation to change; MTC) and (4) a teacher’s assessment of aggressive, conduct and avoidant behaviours that represent a problem for the student (defined as teacher-reported problems; TRP).

Chapter 6 details the method related to the pilot study ($n = 71$) conducted in September 2012. This study elicited important feedback on item content and questionnaire construction. Additional dependent measures (assessing satisfaction with life, help seeking behaviour) were integrated into the pilot study and preliminary evidence for construct validity was found, supporting the BCQ’s inclusion within the main study.

The main study, through the implementation of a pretest ($n = 503$) posttest ($n = 439$) follow-up design (method detailed in Chapter 7), provided the opportunity to assess the psychometric properties of the BCQ. Exploratory Factor Analysis (EFA) and Confirmatory

Factor Analysis (CFA) identified three independent latent factors for both the youth- and teacher-report behavioural dimensions (YRB and TRP). The BCQ (Youth-Report) factors were named (1) Classroom Avoidance, (2) Externalising Behaviours and (3) Mental Absence, while the BCQ (Teacher-Report) factors were named (1) School and Classroom Avoidance, (2) Work Avoidance and (3) Interpersonal Problems. The total and latent factors, specific to the youth- and teacher-reported behavioural dimensions (YRB and TRP), demonstrated acceptable internal reliability and test-retest properties, and exhibited a consistent correlational pattern (in the expected direction) with constructs conceptually related to wellbeing, educational achievement, school attendance, offending and classroom behaviour.

Chapter 6 concludes that the BCQ can reliably assess behaviours indicative of educational disengagement or, in other words, assess the “outcome” of possible change. The use of BCQ to assess change as a “process”, or the motivational constructs underpinning change, remains supported at the factor level. However, Chapter 6 reports that the potential confound between motivation and behavioural type cannot be fully removed within the assessment tool. In short, the chapter concludes that the BCQ can reliably assess “generalised” motivation to change for clusters of behaviours or problems that are empirically or conceptually related.

1.3.6 Main Study Method (Chapter 7)

Chapter 7 details the method, instrument selection (including psychometric properties) and data management processes underpinning the main study. The study employed a population sampling method where all young people referred to the five Operation Flinders program waves in 2013 (N = 414) were approached to enter the study. Control group members were identified by referral agencies using the same criteria as young people attending the Operation Flinders program. A key liaison person (teacher, counsellor or youth practitioner), embedded within the referral agency, took responsibility for the

recruitment and assignment of young people to both the participant and control groups. As anticipated, referral agencies identified young people to attend the Operation Flinders program on the basis of their individual interpretation of the selection criteria and to ensure appropriate group dynamics. In terms of control group recruitment, the key liaison person was asked to “identify young people who would have participated in the program if there were double the number of places available”. In many cases, referral agencies indicated to the researcher that they had already identified a large pool of potential candidates to attend the Operation Flinders program, with the view of managing expected attrition in the lead-up to program attendance. In these cases, the researcher suggested that all young people in the pool be approached and requested to enter the study.

Participants completed a six-page youth-report questionnaire at two points in time; in the week prior to the start of the intervention, and 8-10 weeks post-program. This questionnaire included the Behaviour Change Questionnaire (Youth-Report), and a battery of static risk and outcome measures conceptually and empirically related to offending, educational engagement and wellbeing (see evaluation framework, Table 5.1). Teacher observers were also requested to complete a two-page observational checklist. This included the Behaviour Change Questionnaire (Teacher-Report), the Behavioural Academic Self-Esteem (BASE; Coopersmith & Gilberts, 1982) and a measure assessing positive educational risk taking.

Twelve months after the completion of the main study, a follow-up study collected electronically coded school behavioural data (e.g., suspension, exclusion, attendance, achievement) for both control and treatment participants. This was collated for pre- and post-program monitoring periods constrained by South Australian Government (Department of Education and Child Development) reporting parameters. This data provided the opportunity to conduct an exploratory analysis of medium-term behavioural trends.

As detailed in Chapter 7, a detailed data management plan was implemented for the main study. Multiple imputation was undertaken to address missing data (20 MI data sets). The research identified systemic sampling bias, as evidenced by the Operation Flinders group presenting with a higher proportion of static risk factors (e.g., prior suspensions) compared to the control group. Propensity score matching (PSM) was conducted to match treatment (n = 345) and control groups (n = 209) across the measured covariates (n = 71). PSM models were developed for (1) the entire sample (matching *with* replacement), (2) entire sample (matching *without* replacement), (3) offending risk group (matching *with* replacement), (4) educational disengagement risk group (matching *with* replacement), and (5) poor wellbeing risk group (matching *with* replacement). The offending and educational disengagement risk groups isolated participants with (1) recent offending and (2) recent truancy or a history of school suspension, respectively. The poor wellbeing risk group was stratified on the basis of the participants' pretest subjective wellbeing (or satisfaction with life) scores.

1.3.7 Main Study Results (Chapter 8)

Chapter 8 critically reviews the five PSM models for equivalence across the participant and control groups. Apart from the educational disengagement risk group, all PSM models achieved equivalency, based upon the measured covariates, to support internally valid outcome analyses. Regression based analyses were conducted (SPSS v. 20), with Standardised Beta (β) and Odds Ratio (*OR*) reported for continuous and dichotomous dependent variables, respectively. Effect size interpretation is also reported in Chapter 8.

Across both the selected risk and entire sample groups, Operation Flinders program attendance was not associated with statistically significant and differential improvements relative to a control group, on measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing, motivation to change and problem awareness. The most consistent pattern of program effects was for participants at higher risk

of future offending. These small, but non-significant effects, clustered most strongly on behavioural outcomes, with medium-term outcomes trending in the same direction.

1.3.8 Discussion and Conclusions (Chapter 9 and 10)

Chapter 9 reviews the results in the context of the research question, hypotheses and methodology, and the broader wilderness-adventure literature. The chapter brings a critical lens to internal and external validity specific to the research methodology and instrumentation (BCQ). The chapter includes a review of cross-discipline intervention research and identifies future research directions.

Chapter 10 integrates the research's results and key themes into the broader positive psychology and youth development literature. The chapter reviews the Operation Flinders program in line with best-practice principles of youth programming (Chapter 2) and discusses the potential role of frameworks (e.g. Life Buoyancy Model) to support conceptually sound program development and high fidelity program implementation. Chapter 10 summarises the evidence that supports the heuristic and applied value of the “catalyst for change” descriptor for wilderness-adventure programming for youth-at-risk.

1.4 Thesis Significance

This thesis is significant for the following reasons.

- Within the outdoor, wilderness and adventure literature, it represents the first systematic attempt to operationalise and evaluate the effectiveness of wilderness-adventure programs through the “catalyst to change” descriptor.
- While there has been recent interest in applying the Transtheoretical Model to wilderness-adventure programming (specific to clinically orientated wilderness programming in North America), this remains an area of underdeveloped research. The application of the modelling to educational settings, and outside of North America, represents a unique contribution to the field.

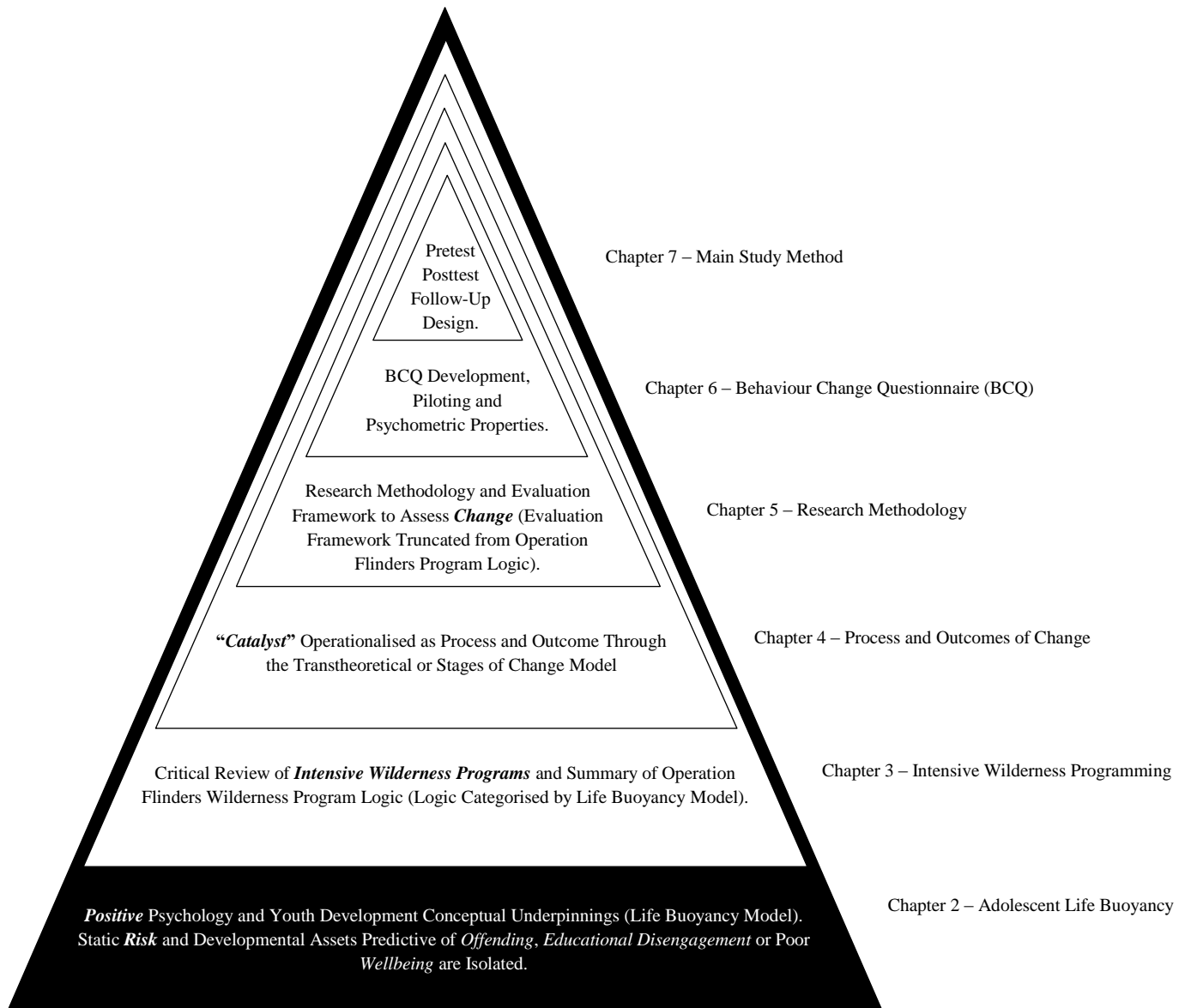
- An important outcome of this research is the development, piloting and psychometric testing of a tool (BCQ) that assesses both behavioural and motivational constructs specific to young people at risk of educational disengagement within mainstream school settings. To the author's knowledge, this is the first time a tool has been developed that assesses both constructs within this context.
- Chapter 3 indicates that there is a complex and confounding interaction between wilderness-adventure program composition/type, participant characteristics (e.g., risk factors) and associated program outcomes. Delineating the moderating impact of participant characteristics has been identified as an area of research needed for the wilderness-adventure discipline (Norton et al., 2014). In response, this research examines the relationship between participant risk (for future offending, educational disengagement and poor wellbeing) and associated program outcomes.
- It demonstrates how positive psychology constructs and modelling can be operationalised across program development and evaluation. That is, the Life Buoyancy Model conceptually organises the program logic for the Operation Flinders program, with this logic model truncated as the evaluation framework underpinning the main study of this research. The integration of positive psychology constructs, across program development and evaluation, remains an area of underdeveloped thinking and research across both the wilderness-adventure and therapeutic literature.
- While there is consistent evidence supporting the short-term efficacy of wilderness-adventure programs for young people at risk of educational disengagement, there is a paucity of longitudinal and strongly controlled

evaluation studies specific to behavioural outcomes. This research responds to this need.

Chapter 2

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future offending, educational disengagement or poor wellbeing?

Chapter 8 – Results
Chapter 9 – Discussion
Chapter 10 - Conclusions



2 Adolescent Life Buoyancy

The aim of this chapter is to contextualise youth offending, educational disengagement and poor wellbeing within a developmental and positive psychology framework. The chapter details the developmental assets (or protective factors) and static risk factors that moderate offending, educational engagement and wellbeing outcomes in young people. Best-practice considerations to grow these assets through youth programming are offered, and the Life Buoyancy Model is presented as a conceptual framework to support program development and evaluation.

2.1 Epistemological Positioning

Crotty (1998) indicated that the research process can be defined and framed by four key processes: (1) epistemology, (2) theoretical perspective, (3) methodology and (4) methods. Epistemology is the theory of knowledge that shapes the type of knowledge that is possible and legitimised within the research process. Crotty and others (Creswell, 2013) argued that this positioning shapes the theoretical perspective and subsequent research methodology. The explicit articulation of the researcher's epistemological position is often overlooked within research design, but when provided, it can add significant value to the research process (Darlaston-Jones, 2007).

Within this research, the author adopts a post-positivism epistemological position. This worldview, while focusing on objectivity (objectivism) and evidence, challenges the traditional notion of the absolute truth of knowledge (Creswell, 2013; Mertens, 2014). This approach brings a strong emphasis to the process of reductionism and a desire to understand the causes that influence outcomes (Creswell, 2013). The adoption of this worldview has been shaped by the author's training and practice as a clinical psychologist, with a focus on children and young people. Through these experiences, the author has brought a lens of

reduction to the ecological predictors that moderate a young person's psychological and behavioural functioning. More recently, this lens has been filtered through a positive psychology worldview. This chapter frames and articulates the author's epistemological positioning.

2.2 Ecological Models of Youth Offending, Educational Disengagement and Poor Wellbeing

Across adolescence, there is both significant inter- and intra-youth variability in terms of psychological and behavioural functioning (Lerner & Galambos, 1998). Ecological models have a pivotal role in explaining this variability by seeking to understand the interaction between a young person's presentation/needs and their social, family, school, community and cultural environments (Bronfenbrenner, 1977, 1992; Bronfenbrenner & Ceci, 1994; Huston & Bentley, 2010; Sameroff, 2010). Ecological approaches remain highly influential across the youth offending, educational and adolescent wellbeing literature. Specifically, they have been applied to understanding social and emotional functioning (AIHW, 2012), youth offending and violence (Brookmeyer, Fanti, & Henrich, 2006; Casey, 2011), school connectedness (Waters, Cross, & Runions, 2009), educational engagement (Fall & Roberts, 2012; Finn & Zimmer, 2012), resilience and coping (Ungar, Ghazinour, & Richter, 2013) and prosocial behaviour (Bowers et al., 2011; Brookmeyer et al., 2006). In short, ecological models uphold the notion that there is a "reciprocal and transactional" relationship between a young person and their societal context (Huston & Bentley, 2010, p. 432). There is a number of different ways by which this reciprocal relationship can be categorised and explained, and the following section brings focus to the categories of (1) risk versus protective factors, and (2) assets and resources.

2.2.1 Risk and Protective Factors

Risk and protective factors are widely applied terms to explain the variability in adolescent development and behaviour (Jessor, van den Bos, Vanderryn, Costa, & Turbin, 1995; Lerner & Galambos, 1998), youth offending (Hoge, Andrews, & Leschied, 1996; Loeber, Burke, & Pardini, 2009), resilience and coping (Fergus & Zimmerman, 2005; Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003), and Indigenous mental health and wellbeing outcomes (Dobia & O'Rourke, 2011; Kelly, Dudgeon, Gee, & Glaskin, 2009; Zubrick et al., 2010). Risk factors can be broadly defined as the conditions or variables that are associated with an increased likelihood of negative outcomes (e.g., offending, educational disengagement or poor wellbeing), while protective (or promotive) factors are associated with a reduction of this likelihood (Jessor et al., 1995).

Risk and protective factors can be further categorised as occurring either proximal (e.g., including skills, attitudes, values and/or behavioural traits) or distal (external) to the young person (e.g., family, school, and/or community). In recent decades there has been strong research interest in understanding the moderating effects of proximal factors located within the individual, for instance biological (Kagan, 2003; Zahn-Waxler, 1996), heredity (Malouff, Rooke, & Schutte, 2008) and epigenetic processes (Zhang & Meaney, 2010). Collectively, the interaction between proximal and distal factors, and/or risk and protective factors, is responsible for future developmental and behavioural outcomes (Lerner et al., 2005; Lerner, Lerner, von Eye, et al., 2011).

In this research, the research question requires the operationalisation and assessment of “risk” specific to future offending, educational disengagement and poor wellbeing outcomes for young people. Drawing upon the forensic psychology literature, risk can be operationalised as *dynamic* or *static* in nature (Andrews & Bonta, 2010a). Dynamic risk factors, referred to as criminogenic needs within the forensic psychology literature (Andrews

& Bonta, 2010a), are factors that have a predictive relationship with the stated outcome (e.g., offending, poor wellbeing), but are amenable to change through intervention. For instance, these may include factors such as self-control, association with negative peers or maladaptive thinking patterns. In contrast, the term static risk refers to demographic (e.g., age, race, gender, SES), behavioural (e.g., offence or suspension history) or other factors (e.g., trauma history) that are not amenable to change through intervention, but have a predictive relationship with the stated outcome. In a subsequent section of this chapter, dynamic and static risk factors predictive of future offending, educational disengagement and poor wellbeing are isolated, and a number of these variables have been included as predictor and dependent variables within the main study (see evaluation framework, Table 5.1). Within this study, dynamic risk factors are reframed with consideration to the positive psychology literature and titled “developmental assets” or “assets”.

2.2.2 Assets and Resources

A number of developmental scientists have further categorised protective factors into the constructs of “assets” and/or “resources” (e.g., Beauvais & Oetting, 1999; Fergus & Zimmerman, 2005; Theokas et al., 2005). These terms are frequently used interchangeably, and without consistent definition, to describe either proximal or distal protective factors. However, for the purpose of this research, assets are defined as “the positive factors that reside in the individual, such as competence, coping skills and self-efficacy” (Fergus & Zimmerman, 2005, p. 399). Thus they are proximal in nature. In contrast, resources are distal factors that support optimal development, and include parental support, adult mentoring, schools, and community organisations (Olsson et al., 2003).

2.3 Positive Youth Development

While the period of adolescence has been traditionally characterised as a period of “storm and stress” (Hall, 1904), developmental psychologists have challenged the

universality of this construct (Arnett, 1999; Hollenstein & Lougheed, 2013), and there is increasing interest in understanding the “opportunities” this transition affords young people (Lerner & Galambos, 1998). This move away from deficit or problem-focused understanding of adolescence has also brought research interest to the “positive” or strength-based qualities underpinning this transition. This has coincided with a broader psychological movement towards “positive psychology” (Seligman, 2002; Seligman & Csikszentmihalyi, 2000). Positive psychology is an umbrella term that details the conditions and processes that strengthen happiness, wellbeing and thriving life engagement, with a focus on building individual strengths for optimal functioning (Seligman & Csikszentmihalyi, 2000). Optimal functioning has been described in terms such as flourishing (Seligman, 2012) and thriving (King et al., 2005; Lerner, Lerner, Bowers, et al., 2011). The construct of wellbeing remains an area of significant interest in positive psychology (Diener, 2000).

Positive psychology constructs have been increasingly operationalised across a range of practice settings (see Linley & Joseph, 2004), including within offending (Ronel & Elisha, 2011; Woldgabreal, Day, & Ward, 2016), educational (Seligman, Ernst, Gillham, Reivich, & Linkins, 2009) and clinical (Wood & Tarrier, 2010) contexts. Following the work of Professor Martin Seligman (2012), a renowned leader in positive psychology, being the Thinker in Residence in South Australia between 2012-2014, there has been a strong interest across South Australia to integrate positive psychology into child and youth practice settings. A strength of the approach is that it brings a focus to wellbeing, positive life engagement and resilience for “all” students and young people, in contrast to traditional psychological interventions that target children and young people at high risk of psychological or behavioural problems (Clonan, Chafouleas, McDougal, & Riley-Tillman, 2004).

North American developmental scientists have integrated both positive psychology and youth development concepts in a research and practice movement titled “positive youth

development” (PYD; Damon, 2004; Gestsdottir & Lerner, 2008; Larson, 2000; Lerner et al., 2003; Lerner et al., 2005; Park, 2004a). This approach was precipitated by the belief that the true capacities and potential of young people was being underestimated through historical models and research focusing on youth deficits (Damon, 2004). This movement explains optimal or “thriving” adolescent development as being a function of the “combined role of characteristics of the person and ecological assets in the family, school, or community settings” (Lerner, Lerner, von Eye, et al., 2011, p. 1107), with the character strengths of competence, confidence, character, connection and caring isolated as foundational moderating variables (Geldhof, Bowers, & Lerner, 2013; Lerner et al., 2005). Character strengths represent proximally-based protective factors or assets (Park, 2004a).

This research has been conceptually inspired by the integration of positive psychology and developmental constructs, as operationalised through the PYD movement (King et al., 2005; Lerner et al., 2003; Lerner, Lerner, von Eye, et al., 2011). It seeks to understand the proximal assets that reduce a young person’s risk for future offending, educational disengagement or poor wellbeing. Within Australia, there is a paucity of research integrating positive psychology and developmental constructs. Internationally, further work is required to broaden the applied, conceptual and research base of positive psychology (Norrish & Vella-Brodrick, 2009; Power, 2015). Specifically, compared to adults, the operationalisation of positive psychology constructs for adolescent cohorts remains significantly underdeveloped and has been identified as a research need (Norrish & Vella-Brodrick, 2009). This research responds to this need through applying positive psychology constructs to categorise the evaluation framework (Table 5.1) underpinning the main study as reported in this thesis.

2.3.1 Developmental Assets and Static Risk Factors

This section identifies proximal assets (e.g., skills, attitudes, values and/or behavioural traits) that have an empirical or predictive relationship with reduced offending risk, increased educational engagement or enhanced wellbeing. It is noted that a number of these assets (e.g., social and emotional skills) have an indirect or mediating impact on these three outcomes. That is, through the strengthening of proximal assets, young people have increased capacity to engage optimally with distal protective factors or resources (e.g., parents, peers, teachers, community), and through these resources, positive outcomes specific to offending, education and wellbeing are delivered. For example, supportive relationships with family (Carter, McGee, Taylor, & Williams, 2007; Ungar, 2004) and teachers (Decker, Dona, & Christenson, 2007), positive and responsive classroom environments (Nickolite & Doll, 2008), and pro-social peer relationships (Bond et al., 2007; Cohen, 2004) are all protective resources in the lives of young people.

Of particular interest to this research, a young person's connectedness or engagement with school remains a strong predictor of future life outcomes, including life satisfaction, physical health, stable mental health, job engagement and stability, and reduced risk of delinquency (Archambault, Janosz, Fallu, & Pagani, 2009; Bond et al., 2007; Carter et al., 2007; Cohen, 2004; Heckman, 2008; Li et al., 2011; McNeely & Falci, 2004; Shochet, Dadds, Ham, & Montague, 2006). In short, schools and educational settings are foundational resources to lower offending risk, enhance wellbeing and foster whole-of-life outcomes. Collectively, while this research brings a strong focus to proximal factors, it is noted that variations in offending, educational engagement and wellbeing outcomes are dependent on the interaction between both proximal and distal factors (Lerner et al., 2005; Lerner, Lerner, von Eye, et al., 2011). The restricted focus on proximal factors remains a limitation of the research.

From this point forward, the term “asset” is applied interchangeably with the broader term “developmental asset”. This later term, applied by Theokas et al. (2005), brings attention to the integration of positive psychology and youth development constructs.

Applying these terms, the primary research question could therefore be reframed as:

What is the effectiveness of intensive wilderness programs to grow the developmental assets that reduce a young person’s risk for future offending, educational disengagement or poor wellbeing?

The following section operationalises the constructs of offending, educational engagement and wellbeing, and isolates developmental assets and static risk factors that have an empirical or conceptual relationship with all three constructs. The section summarises (through tables) the evidence that supports the inclusion of the static risk factors and dependent variables (developmental assets) in the main study.

2.3.1.1 Offending

Definitions of offending or criminal behaviours are constructed through social, psychological, legal and moral parameters (Andrews & Bonta, 2010a). In this thesis, “offending” is defined as “acts or behaviour which, whether or not detected, warrant potential legal proceedings being taken against the individual” (Barry, 2006, p. 8). This definition brings a focus to the “law” and the engagement of justice systems, and reflects widely applied definitions of offending or criminal conduct (e.g., Andrews & Bonta, 2010a).

The forensic psychology discipline has developed a strong reputation for conducting robust and evidence-based interventions (Day & Howells, 2002). In the past two decades, a theoretical and practice framework has emerged that describes the best practice principles (or “what works”) for offender rehabilitation based upon the principles of *risk*, *need*, and *responsivity* (Andrews & Bonta, 2010a). The model has been previously applied by the author (Raymond, 2003; Raymond & Lappin, 2011) and others (Mohr et al., 2001) in the

evaluation of Australian-based wilderness interventions. The three principles are articulated as follows:

- The “*risk principle*” suggests that the most intensive interventions should be targeted to individuals who are at the highest risk of future offending or at-risk behaviour.
- According to the “*need principle*”, interventions should target the factors (or criminogenic needs) that directly mediate the future at-risk or dysfunctional behaviour. Needs include the attitudes, values, beliefs and behaviours that an individual uses to support and maintain offending or at-risk behaviour (Andrews & Bonta, 2010a).
- The principle of “*responsivity*” is considered the catalyst of treatment provision (Bonta, 1996). It concerns the program or client traits (e.g., learning styles, cognitive capacity) that mediate the effectiveness of the intervention.

The model remains highly influential across both Australian juvenile justice (Day, Howells, & Rickwood, 2004) and adult offender management settings (Howells & Day, 1999), and international offender management programs more generally (Andrews & Bonta, 2010a, 2010b). As previously noted, this research positively reframes criminogenic needs as developmental assets (or protective proximal factors). In the forensic psychology literature, criminogenic needs provide the focal point of youth justice intervention and program evaluation (dependent variable) (Day, 2005, 2011; Day et al., 2004). Table 2.1 summarises the developmental assets and static risk factors that have a conceptual and empirical relationship with youth offending.

Table 2.1

Developmental Assets and Static Risk Factors Conceptually and Empirically Related to Youth Offending

Static Risk Factors	Developmental Assets ^b
<ul style="list-style-type: none"> • Age of first offence and first contact with law, family problems, conduct problems, number and type of prior commitments, intelligence, history of abuse, out-of-home placements, gender, standardised achievement scores, history of abuse, race, socio-economic status, single-parent household (Cottle, Lee, & Heilbrun, 2001; Hoge et al., 1996)^a • Intergenerational trauma (Serbin & Karp, 2004) and child maltreatment (Stewart, Dennison, & Waterson, 2002) • Early language and cognitive development (Stattin & Klackenberg-Larsson, 1993) • Reading comprehension (Rucklidge, McLean, & Bateup, 2013) • Non-verbal reasoning (Putniņš, 1999) 	<ul style="list-style-type: none"> • Intrinsic value orientation (Williams, Cox, Hedberg, & Deci, 2000) • Self-regulation, anger regulation, impulse control, self-control (Day, 2009; Miller, Yu, Chen, & Brody, 2015; Robbins & Bryan, 2004) • Prosocial values and attitudes, including positive attitudes to police and authority (Granic & Butler, 1998) • Positive emotions (Day, 2009) • Attention regulation (Moffitt, 1990; Putniņš, 1999) • Prosocial goal setting (Samson, Ojanen, & Hollo, 2012) and self-efficacy (Carroll, Gordon, Haynes, & Houghton, 2013) • Empathy (perspective taking) (Jolliffe & Farrington, 2004) • Consequential thinking (Guerra, 1989) • Coping skills (Hurrelmann & Raithel, 2005) • Positive future orientation (Robbins & Bryan, 2004) • Problem solving skills (Kazdin, Esveldt-Dawson, French, & Unis, 1987)

Note: ^aThis meta-analysis by Cottle et al. (2001) is widely cited within the forensic psychology literature to operationalise static risk factors. ^b This list represents proximal factors associated with reduced future offending risk.

2.3.1.2 Educational Engagement

School engagement is a multi-dimensional construct (Finn & Zimmer, 2012) that is not consistently defined nor easily differentiated from other educational constructs. For instance, it shares significant overlap with the constructs of “school connectedness” (e.g., Shochet et al., 2006; Waters et al., 2009) and student motivation (e.g., Covington, 2000; Liem & Martin, 2012). Educational engagement has been operationalised through psychological, academic achievement, behavioural, affective and cognitive components (Appleton, Christenson, Kim, & Reschly, 2006; Archambault et al., 2009; Fredricks, Blumenfeld, &

Paris, 2004; Wang, Willett, & Eccles, 2011). Fredricks et al. (2004) proposed a definition that included behavioural, affective and cognitive indices, and this has been applied and extended by others (e.g., Archambault et al., 2009; Wang et al., 2011). The indices are considered in turn.

- *Behavioural* - student behaviours and conduct that relate to “psychosocial adjustment and achievement at school” (Archambault et al., 2009, p. 653), that may include positive versus negative behaviours (e.g., attending versus not attending class), participation in school related tasks (e.g., homework) and the engagement with additional extracurricular activities.
- *Affective* – the feelings, interests, values, appraisals and attitudes towards school (including teachers).
- *Cognitive* – the student’s investment in learning and strategies and tools they apply to engage in learning activities.

This research operationalises educational engagement through the (1) psychological (cognitive and affective) and (2) behavioural features that aid participation, learning and motivation for school specific tasks. This psychological-behavioural differentiation has been proposed by others (Finn & Zimmer, 2012; Liem & Martin, 2012), and is consistent with research that indicates psychological and behavioural features of engagement demonstrate different patterns of variability as a function of student characteristics (Gemici & Lu, 2014; Li & Lerner, 2011; Waters, Cross, & Shaw, 2010b) and relationships with other constructs (e.g., life satisfaction, Lewis, Huebner, Malone, & Valois, 2011). For example, in comparison to psychological indices, the behavioural features of positive educational engagement exhibit stronger negative correlations with future substance use, delinquency (Li et al., 2011) and school drop-out (Archambault et al., 2009).

Table 2.2 summarises the developmental assets and static risk factors that are conceptually and empirically related to educational engagement. Across the literature, academic achievement (e.g., student grades) is conceptually and empirically related to educational engagement. There is a strong positive correlation between measures of educational engagement and student achievement scores (Fall & Roberts, 2012; Gemici & Lu, 2014). For this reason, a review of the academic achievement literature was also conducted to isolate developmental assets and static risk factors conceptually related to this outcome, and these factors have been integrated within Table 2.2.

Table 2.2

Developmental Assets and Static Risk Factors Conceptually and Empirically Related to Educational Engagement

Static Risk Factors	Developmental Assets
<ul style="list-style-type: none"> • Race (Li & Lerner, 2011; Wang et al., 2011) • Sex (Hendriks, Kuypers, Lubbers, & Van der Werf, 2011; Li & Lerner, 2011; Wang et al., 2011) • Learning style and meta-cognitive factors (Winne & Nesbit, 2010) • Age (Benner & Wang, 2014; Gemici & Lu, 2014) • SES (Li & Lerner, 2011) • School setting conditions (Meece, Anderman, & Anderman, 2006; Waters et al., 2009) • Foreign born (Gemici & Lu, 2014) • Language at home (Gemici & Lu, 2014) • Family composition (Gemici & Lu, 2014) 	<ul style="list-style-type: none"> • Perceived control, low anxiety (or composure), coordination (planning), commitment and persistence (Martin et al., 2010) • Self-efficacy (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Boon, 2007; Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011; Carroll et al., 2009; Martin & Marsh, 2008; Mercer, Nellis, Martinez, & Kirk, 2011; Roeser, van der Wolf, & Strobel, 2001) • Internal locus of control (Gilman & Anderman, 2006; Keith, Pottebaum, & Eberhart, 1986) • Self-concept (including self-esteem, self-efficacy) (Gilman & Anderman, 2006; Huang, 2011; Lipschitz-Elhawi & Itzhaky, 2005) • Emotional stability (Hendriks et al., 2011), self-control (Graziano, Reavis, Keane, & Calkins, 2007; Gumora, 2002) • Higher intrinsic motivation (Gilman & Anderman, 2006; Vansteenkiste, Lens, & Deci, 2006) • Post-modern (Dietz, Hofer, & Fries, 2007) and intrinsic (Kasser, 2016) value orientation • Positive future orientation (Kerpelman, Eryigit, & Stephens, 2008) • Positive educational expectations (Liu, Cheng, Chen, & Wu, 2009) • Motivation (Winne & Nesbit, 2010) • Cognitive processes, for instance growth mindset (Dweck, 2012) • Goal setting self-efficacy (Covington, 2000; Mansfield, 2010; Massey, Gebhardt, & Garnefski, 2009) • Social and emotional competencies (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Gumora, 2002; Roeser et al., 2001) • Satisfaction with life (Gilman & Huebner, 2006; Lewis et al., 2011)

Australian research indicates that a student's connectedness or engagement with school is a function of both proximal student characteristics and distal school/community factors (Waters, Cross, & Shaw, 2010a; Waters et al., 2010b). However, proximal or student related factors continue to account for significant levels of variance in student engagement and achievement levels (Gemici & Lu, 2014; Martin & Marsh, 2008; Mikolashek, 2004). Of interest to this research, Gemici and Lu (2014) analysed data from the Longitudinal Surveys

of Australian Youth (LSAY) to examine a wide range of school characteristics and their impact on students' psychological engagement with school at age 15 years. They found that once individual background factors had been controlled, school related distal factors accounted for only 4.3% of students' emotional engagement and 7.5% of their cognitive engagement. The authors further stated that "the overall amount of variance attributable to school factors is even smaller for the sub-sample of at-risk students. For at-risk students, school characteristics account for 1.4% and 4.4% of emotional and cognitive engagement, respectively" (p. 8.). Gemici and Lu concluded that individual or proximal factors have a foundational role to explain educational engagement, providing support for their inclusion within this research.

2.3.1.3 Wellbeing

There is no unified definition of "wellbeing" (Hamilton & Redmond, 2010; Pollard & Lee, 2003). The Australian Institute of Health and Welfare (AIHW, 2012) operationalised wellbeing through an ecological framework that included both proximal factors (developmental assets), for instance, optimism, happiness, social and emotional skills, as well as distal resources, including relationships and community engagement. International definitions mirror this position, with child and youth wellbeing assessed through both broad-based ecological indices and subjective reports (UNICEF, 2007).

In a detailed review, Hamilton and Redmond (2010) defined wellbeing as a "concept" that is constructed through the "political visions of society, and visions of children's and young people's place in it." (vii). The socially constructed nature of wellbeing is discussed in detail by Eckersley (2011). Australian young people also construct wellbeing in terms of its multi-dimensionality (Bourke & Geldens, 2007; Soutter, 2011), with qualitative research indicating this occurs differently to adults (Bourke & Geldens, 2007). Within Australia,

wellbeing is constructed and expressed differently across Indigenous cohorts (Zubrick et al., 2010).

This research restricts itself to the operationalisation and assessment of subjective wellbeing. This restricted focus is consistent with like research across the positive youth development (Park, 2004b), developmental (Lyons et al., 2013; Parker et al., 2015) and educational (Lewis et al., 2011) literature. Subjective wellbeing is a “broad category of phenomena that includes people’s emotional responses, domain satisfactions and global judgements of life satisfaction” (Deiner, Suh, Lucas, & Smith, 1999, p. 277). Diener (2000, p. 34) argued that “people experience abundant SWB [subjective wellbeing] when they feel many pleasant and few unpleasant emotions, when they are engaged in interesting activities, when they experience many pleasures and few pains, and when they are satisfied with their lives”. In short, subjective wellbeing has both affective and cognitive components. The cognitive component, defined as “satisfaction with life”, includes appraisals an individual brings to their life overall or to specific or multiple domains (e.g., family, school, work) (Deiner et al., 1999; Diener, 2000). It has been operationalised and assessed in respect to both multiple (Antaramian & Huebner, 2009) and specific life domains (e.g., schools, Huebner, 1991), or as a global measure (Diener, Emmons, Larsen, & Griffin, 1985; Gadermann, Schonert-Reichl, & Zumbo, 2010). Life satisfaction has been applied as a marker for population mental health (Bray & Gunnell, 2006), and has been widely used to assess adolescent wellbeing (Antaramian, Huebner, & Valois, 2008), including young people at risk of educational disengagement (Lewis et al., 2011) or presenting with maladaptive behaviours (Lyons, Otis, Huebner, & Hills, 2014).

Table 2.3 summarises the developmental assets and static risk factors that are conceptually and empirically related to the cognitive and affective components of subjective

wellbeing, including satisfaction with life, positive affect (hope, happiness) and lack of negative affect (e.g., depression).

Table 2.3

Developmental Assets and Static Risk Factors Conceptually and Empirically Related to Wellbeing

Static Risk Factors	Developmental Assets
<ul style="list-style-type: none"> • Sex (Li & Lerner, 2011) • SES (Li & Lerner, 2011) • Indigenous (AIHW, 2011), race (Li & Lerner, 2011) • Remote living location (AIHW, 2011) • Natural disasters and trauma (Masten, 2014; Masten & Narayan, 2012) • Intergenerational trauma and risk factors (Serbin & Karp, 2004) • Societal structural determinants (Viner et al., 2012) • School setting conditions (Waters et al., 2009) 	<ul style="list-style-type: none"> • Intrinsic values and goal setting (Kasser, 2016; Massey, 2008) • Optimism (Carver, Scheier, & Segerstrom, 2010; Nes & Segerstrom, 2006; Patton et al., 2011) and hopeful future orientation (Parker et al., 2015; Schmid, Phelps, & Lerner, 2011; Seginer & Lilach, 2004; Valle, Huebner, & Suldo, 2006) • Self-regulation (Schmid et al., 2011) • Connection to culture (Kelly et al., 2009) • Adaptive cognitive coping to stress or adversity (Kraaij et al., 2003) • Adaptive self-reflection (White, Kross, & Duckworth, 2015) • Self-efficacy (Massey et al., 2009; Roeser et al., 2001) • Internal locus of control (Gilman & Huebner, 2006; Huebner, Funk, & Gilman, 2000) • Positive self-concept (Guhn et al., 2012) • Self-esteem (Gilman & Anderman, 2006; Gilman & Huebner, 2006) • Conscientiousness (Friedman, Kern, Abas, Hotopf, & Prince, 2014) • Meaning making (Steger, 2012) • Life satisfaction (Bray & Gunnell, 2006; Deiner et al., 1999) • Positive affect (Seligman, 2012)

2.4 Asset Building Programs and Best-Practice Principles

There is a diverse range of youth programs that target proximal factors or developmental assets associated with offending, educational engagement and wellbeing outcomes in young people. For example, programs have been developed to target social and emotional competencies, victim awareness, problem solving, self-esteem, resilience and

coping, and anger reduction. Meta-analyses support the effectiveness of these programs across offending, educational and wellbeing contexts. For example, cognitive behavioural skills programs have been shown to reduce (1) offending or recidivism (Redondo, Sanchez-Meca, & Garrido, 1999), (2) anger (Sukhodolsky, Kassinove, & Gorman, 2004), (3) antisocial behaviour (Bennett & Gibbons, 2000), and (4) anxiety (James, James, Cowdrey, Soler, & Choke, 2013). In a landmark meta-analysis, Durlak et al. (2011) found that programs delivered within school settings and designed to increase social and emotional competencies in children and young people demonstrated significant promise.

Despite this, asset building programs for youth are not equally effective (Hattie et al., 1997). This is reflected in the high levels of between-evaluation variability noted within meta-analyses in terms of outcome effect size and direction (e.g., Bowen & Neill, 2013; Cason & Gillis, 1994; Hattie et al., 1997; Wilson & Lipsey, 2000). Meta-analytic studies frequently isolate participant, program, evaluation and contextual variables that are statistically significant moderators of program effect sizes. This information is consolidated in “what works” reviews of program implementation. Such reviews have been developed across offending (Sallybanks, 2003), educational (Weissberg & O’Brien, 2004) and wellbeing program contexts (Sanson, Havighurst, & Zubrick, 2011).

Through the author’s review of meta-analytic studies and the “what works” literature, five best-practice principles of asset-building programs for young people at risk of offending, educational disengagement and poor wellbeing are proposed. They include³:

1. *Conceptually Sound* – Such programs have clear aims and objectives (Sallybanks, 2003); they describe the relationship between program processes and outcomes; and they are founded upon a clear program logic or program theory that is informed by empirical evidence (Bamberger, Rugh, & Mabry, 2012). Across

³ These five principles are referred to throughout this study. Chapter 10 reviews the Operation Flinders program against these principles, and provides program development recommendations to support increased program impact.

- forensic contexts, conceptually sound programs are associated with the largest program effect sizes (Antonowicz & Ross, 1994), with a recent meta-analysis indicating that programs for young offenders founded upon a therapeutic philosophy demonstrated larger program impacts (Lipsey, 2009).
2. *Skill Focused* – Programs that bring a strong focus to skill development are in the best position to achieve larger program outcomes (Antonowicz & Ross, 1994; Burack et al., 2006; Clarke, 2006; de Vries, Hoeve, Assink, Stams, & Asscher, 2015; Durlak et al., 2011; Heckman, 2008; Keen, 2011; Sallybanks, 2003). These programs include clearly articulated outcomes (e.g., social, cognitive, behavioural and emotional competencies); and activities, strategies and processes that are connected and coordinated to deliver these outcomes (Durlak et al., 2011).
 3. *Targeted* – Program outcomes are maximised when the intervention is targeted to young people whose psychological or behavioural presentation is consistent with the intended outcomes of the program (Andrews & Bonta, 2010a; de Vries et al., 2015).
 4. *Responsive* – Programs that seek to understand the factors that engage, positively challenge and motivate young people, and then tailor program delivery to these aspects, are in the best position to deliver meaningful program outcomes (Antonowicz & Ross, 1994; Durlak et al., 2011). This reflects the best practice forensic principle of “responsivity” (Andrews & Bonta, 2010a).
 5. *Program Integrity* – Programs with strong program integrity (or fidelity) are implemented as intended and designed; minimise program “drift” or ad hoc changes to program implementation or design (Mertens & Wilson, 2012); have clearly defined program elements and processes (Goldkamp, 2010) and bring planning and monitoring to implementation (Durlak & DuPre, 2008; Fixsen, Blase,

Naoom, & Wallace, 2009). Implementation quality and program integrity remains a strong predictor of program impact across educational, wellbeing and offending settings (Antonowicz & Ross, 1994; Askell-Williams, Dix, Lawson, & Slee, 2013; Dix, Slee, Lawson, & Keeves, 2012; Lipsey, 2009; Slee et al., 2009) and a best-practice feature of youth offender interventions (Day et al., 2004).

Meta-analytic studies indicate that there are significant variations in the degree programs uphold one or more of the aforementioned considerations (e.g., Durlak et al., 2011; Lipsey, 2009). Reflecting this point, in their review of three Australian wilderness programs, Raymond and Lappin (2011) concluded that the programs had been designed and implemented from a founder's vision, as opposed to a conceptually sound program model, informed by evidence. This point is equally attributable to the Operation Flinders program at the focus of this research (Murray-White, 1994).

The author identified a need for program developers to integrate theoretical and empirical evidence into the conceptualisation and implementation of programs purported to deliver youth offending, educational and wellbeing outcomes. However, it was believed that this development should occur in a manner where developers could retain their autonomy, creative flair and innovation within program design and implementation. The Life Buoyancy Model was inspired and developed from this context.

2.5 Life Buoyancy Model⁴

At its broadest level, the Life Buoyancy Model is a program logic framework that conceptualises and categorises the relationship between program components, program processes and a hierarchy of short-, medium- and long-term outcomes. Program logic is an approach that conceptually (and logically) describes the relationships (or intent) between an

⁴This section is provided to support the reader to develop a broad and conceptual understanding of the Life Buoyancy Model. This thesis makes no attempt to systematically review or assess the model, but instead, the model is provided to demonstrate how positive psychology constructs can be operationalised across both program development and evaluation. The Life Buoyancy Model is currently being written for peer review.

individual program's processes (or components/resources/activities) and its outcomes (or outputs) (Cooksy et al., 2001). Such models provide a mechanism to describe the relationship between short- and longer-term outcomes (Julian, 1997) to guide multi-method evaluation (Cooksy et al., 2001), and to support organisations develop a shared understanding of the underpinnings of their program model (McLaughlin & Jordan, 1999). The model is summarised in Figure 2.1, and has been operationalised as the Operation Flinders program logic in the following chapter. The following section briefly describes the key features of the modelling.

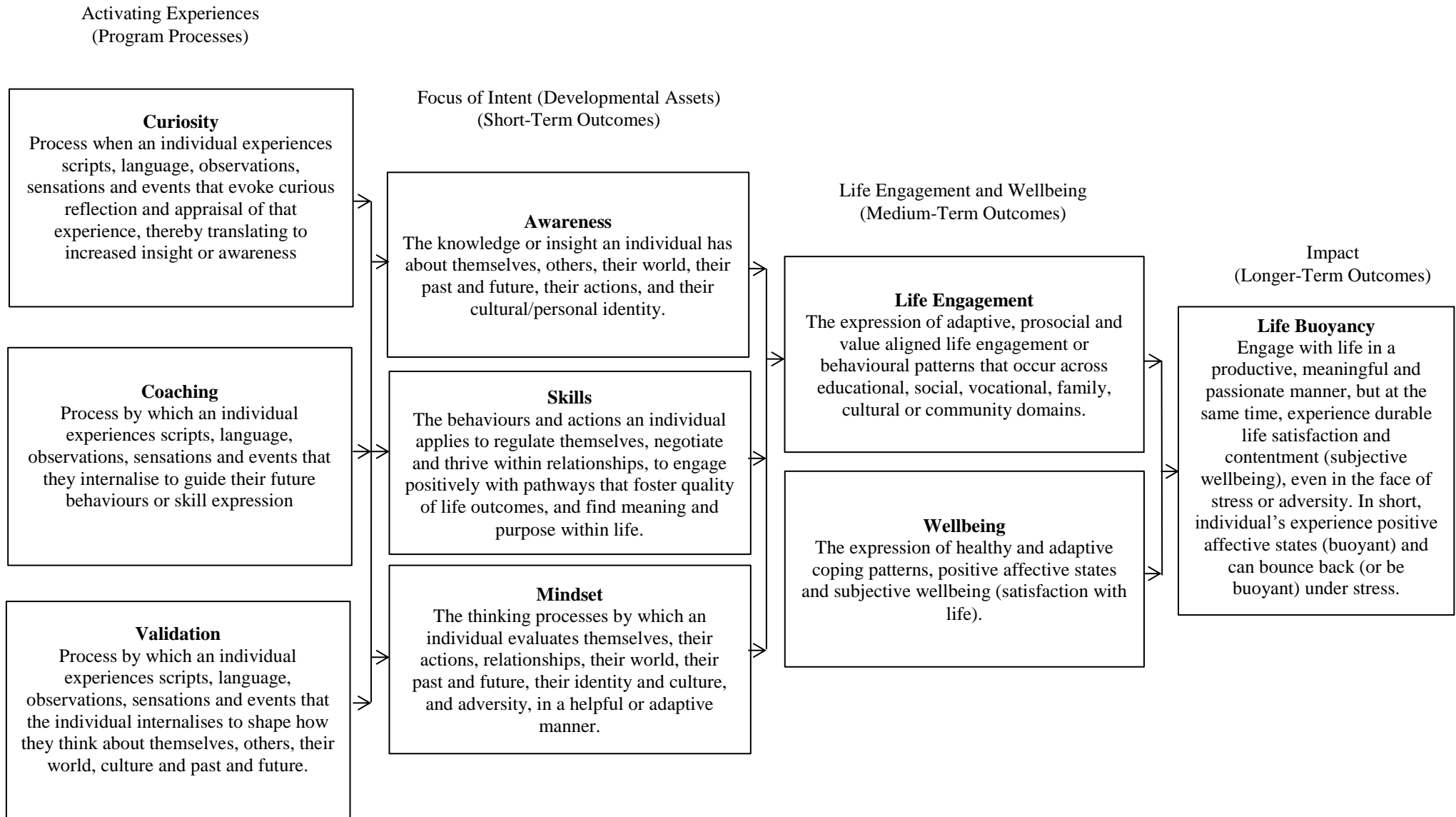


Figure 2.1 Life Buoyancy Translational Framework

2.5.1 Life Buoyancy (Long-Term Outcome or Program Impact)

The Life Buoyancy Model proposes that a foundational long-term objective of all asset building programs is to support young people be life buoyant. Young people who are life buoyant:

Engage with life in a productive, meaningful and passionate manner, but at the same time, experience durable life satisfaction and contentment (subjective wellbeing), even in the face of stress or adversity. In short, individual's experience positive affective states (buoyant) and can bounce back (or be buoyant) under stress.

This construct is informed and inspired by the positive psychology (Seligman, 2012), resilience (Fergus & Zimmerman, 2005) and subjective wellbeing (Antaramian et al., 2008) literature. It has also been developed with reference to the construct of "academic buoyancy", which operationalises the processes by which students successfully deal with academic setbacks and challenges that are typical of school life (Martin, Colmar, Davey, & Marsh, 2010; Martin & Marsh, 2008).

2.5.2 Engagement and Wellbeing (Medium-Term Outcomes)

The medium-term outcome of the Life Buoyancy Model brings a focus to (1) wellbeing and (2) life engagement. These medium term outcomes have a conceptual relationship with the long-term outcome (life buoyancy), and bring an important medium-term focus to asset-building programs which is the growth of positive of life engagement (or behavioural patterns) and wellbeing. This dual focus on behavioural patterns (engagement) and wellbeing supports the operationalisation of the model across offending, educational and wellbeing settings.

2.5.3 Focus of Intent (Short-Term Outcomes)

Short-term outcomes reflect the immediate focus of the program, or the intent behind program or practice delivery (intentional practice). These outcomes have an evidence-

informed relationship with the medium-term outcome (wellbeing and engagement) and are categorised under the constructs of (1) awareness, (2) skills and (3) mindset. The Life Buoyancy model proposes that asset building programs can have their short-term outcomes aligned to these three categories. For example, the developmental assets summarised for offending (Table 2.1), educational engagement (Table 2.2) and wellbeing (Table 2.3) can be categorised under the headings of awareness, skills or mindset (for example, see Figure 3.1).

2.5.4 Activating Experiences (Program Processes)

The model proposes that there are three key processes foundational to the development of awareness, skills and mindset. These include: curiosity (linked most strongly to awareness development), coaching (linked most strongly to skill development) and validation (linked most strongly to mindset development). These processes are informed by the positive psychology and therapeutic literature (Hall & Cook, 2012; Seligman, 2007). To operationalise the modelling further, program developers are encouraged to consider how program activities and components relate to specific focus points of intent (awareness, skill or mindset) and how specific program processes (e.g., curiosity, coaching or validation) can support the delivery of that outcome⁵.

2.5.5 Applications and Relevance to Research

The Life Buoyancy Model represents a growth-focused model of intentional practice. It has been operationalised through a variety of therapeutic and asset building programs for young people; including the development of intensive wilderness programs for young people at risk of offending, educational disengagement and poor wellbeing in the Northern Territory (Raymond & Lappin, 2015, 2016). This included the design, categorisation and articulation of a program logic model underpinning the Operation Flinders wilderness program (Raymond & Lappin, 2015), as reproduced in Chapter 3 (Figure 3.1). This thesis makes no

⁵ It is beyond the scope of this thesis for this to be explained in detail. For further information, the reader is encouraged to read Raymond and Lappin (2015).

attempt to systematically test or validate either the Life Buoyancy Model or Operation Flinders program logic. Instead, these interdependent frameworks are provided to support the organisation of the short- and medium-term outcome measures applied within this research (see evaluation framework, Table 5.1), and demonstrate how positive psychology constructs can be operationalised into program development and evaluation.

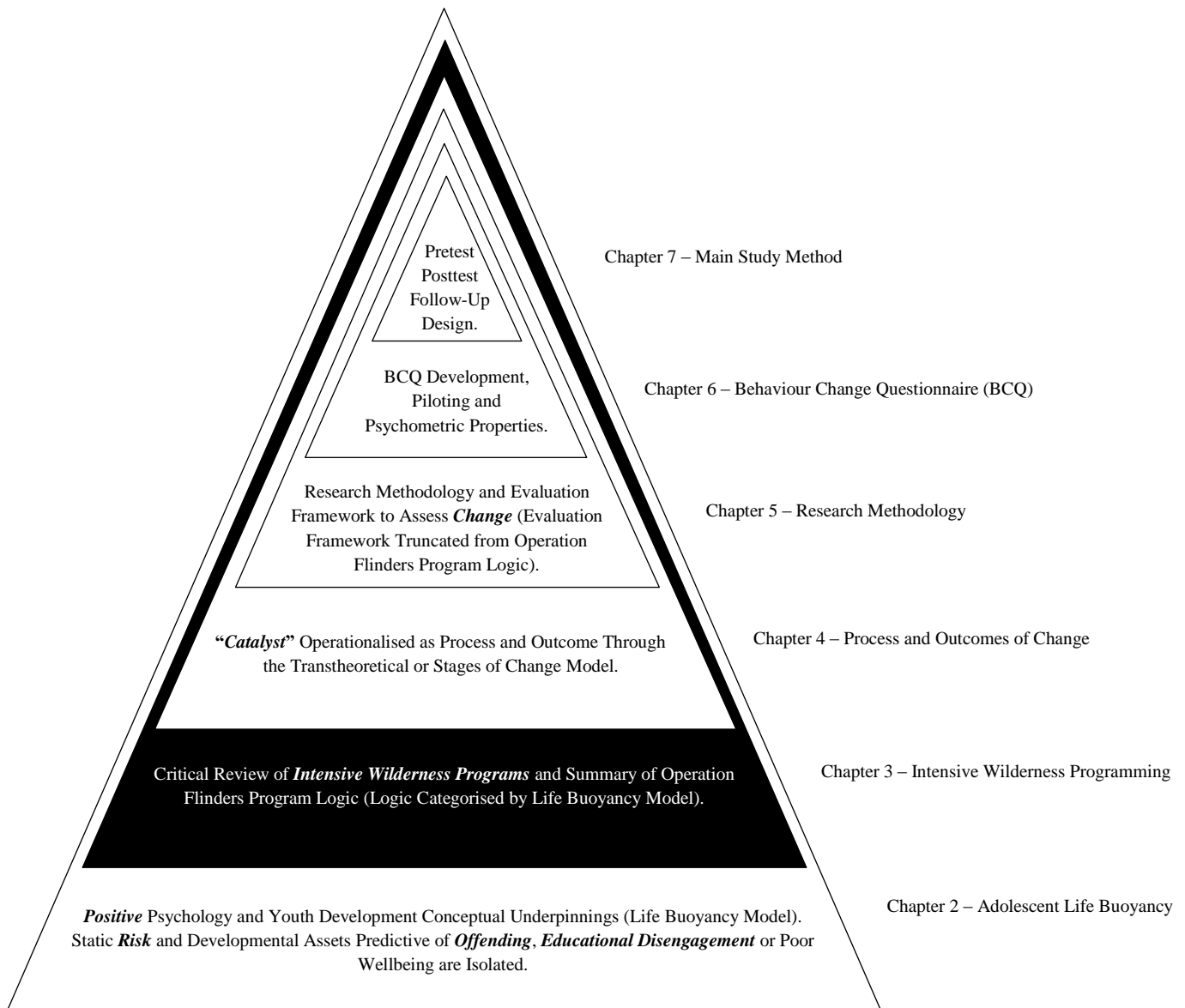
2.6 Chapter Summary

This chapter has contextualised youth offending, educational disengagement and poor wellbeing within a developmental and positive psychology framework. Specifically, it has isolated developmental assets (or protective factors) and static risk factors predictive of offending, educational engagement and wellbeing outcomes in young people. Many of these variables have been included within the evaluation framework (Table 5.1) and operationalised within the main study. Five best-practice considerations for the development and implementation of asset building programs for young people were proposed. They include: (1) conceptually sound, (2) responsive, (3) program integrity, (4) skill-focused and (5) targeted. These program considerations are referred to throughout this research.

Chapter 3

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
 Chapter 9 – Discussion
 Chapter 10 - Conclusions



3 Intensive Wilderness Programming

This chapter provides a critical review of the context, conceptual underpinnings and effectiveness of intensive wilderness programs for young people at risk of offending, educational disengagement and poor wellbeing. Across Australia and internationally, program developers, practitioners and researchers have described wilderness-adventure programs in terms of their capacity to be “catalysts for change”. This chapter indicates that these catalytic effects have not been systematically operationalised nor assessed within the literature, and this remains a key objective of this research.

3.1 Context

Within Australia, programs that include an outdoor, wilderness or adventure component have attracted strong interest as an intervention for youth-at-risk (Mason & Wilson, 1988). At the broadest level, these programs include young people being engaged within an outdoor or wilderness setting, and undertaking a range of hands-on or experiential activities that are designed to evoke positive change or psychological growth (Davis-Berman & Berman, 1994b; Gass, 1993b). Specifically, the intervention seeks to “kinesthetically engage clients on cognitive, affective and behavioural levels” (Gass et al., 2012, p. 1). While evidence indicates that the intervention can deliver meaningful outcomes (Bedard et al., 2003; Bowen & Neill, 2013; Wilson & Lipsey, 2000), the widespread application of the modality appears largely driven by intuitive appeal as opposed to robust research and empirical validation (Heseltine et al., 2003). Within subsequent sections of this chapter, a critical review of the effectiveness of wilderness-adventure programs is conducted. However, prior to conducting this review, the heterogeneous nature of programming is detailed, to support the reader to understand the critical and nuanced lens that needs to be brought to the wilderness literature.

3.1.1 Heterogeneity of Wilderness-Adventure Programming

Wilderness-adventure interventions are notably heterogeneous. In a recent review of Australian-based outdoor youth programs, Williams and Allen (2012) reported that they “represent an incredible diversity of practice, varying on characteristics such as duration, participant group size, physical setting, activities used, staff-to-participant ratios, and program goals” (p.1). This heterogeneity is replicated internationally (e.g., North America, see Bell, Gass, Nafziger, & Starbuck, 2014), and has translated to wilderness-adventure programs being adapted to a range of participant cohorts and sectors, including: disability (Herbert, 1998), foster care (Fischer & Attah, 2001), adults with cognitive impairment (Walker, Onus, Doyle, Clare, & McCarthy, 2005), clinical or mental health settings (Hill, 2007), high school students (Dolgin, 2014), young adults (Hoag, Massey, Roberts, & Logan, 2013), adolescents with substance abuse problems (Bettmann, Russell, & Parry, 2013; Russell, 2008) and youth at risk of offending (Castellano & Soderstrom, 1992; Gillis & Gass, 2010).

Researchers and practitioners have found it difficult to clearly define or operationalise the diverse spectrum of wilderness-adventure programs, including delineating them from purely recreational or camping-based experiences (Davis-Berman & Berman, 1994b; Russell, 2001), or more punitive or control based interventions, like boot-camps (Russell, 2006a). Within the literature, the spectrum of outdoor programs have been defined and operationalised as wilderness therapy (Davis-Berman & Berman, 1994b; Russell, 2001), wilderness-adventure therapy (Weston, Tinsley, & O'Dell, 1999), wilderness challenge programs (Wilson & Lipsey, 2000), bush counselling (Adams & Sveen, 2000), bush adventure therapy (Pryor, Carpenter, & Townsend, 2005), youth adventure programming (Deane & Harré, 2014), adventure therapy (Gass, 1993c; Itin, 2001; Newes & Bandoroff, 2004; Norton et al., 2014), and ecotherapy or nature-guided therapy (Beringer, 2004). Each

definition brings a content focus to the key program component underpinning the intervention. For the past two decades, there has been ongoing research and practitioner interest to isolate and understand the programmatic features of wilderness-adventure programs associated with intervention outcomes (Brand & Smith, 1999; McKenzie, 2000; Neill & Heubeck, 1997; Norton et al., 2014). A number of individual studies and meta-analytic reviews have identified a relationship between program components (e.g., length, intensity, inclusion of therapeutic enhancement strategies), client characteristics (e.g., age, gender) and associated outcomes (Goldenberg, McAvoy, & Klenosky, 2005; Hattie et al., 1997; Magle-Haberek, Tucker, & Gass, 2012; Tucker, Smith, & Gass, 2014; Wilson & Lipsey, 2000). However, no clear pattern of program moderators has emerged (Norton et al., 2014), and meta-analyses conducted over the past two decades provide conflicting results. For example, Bowen and Neill (2013) isolated age as the sole moderator of adventure therapy outcomes, with the moderating effects found to be within the opposite direction to an earlier meta-analysis restricted to an adolescent cohort (Cason & Gillis, 1994). Collectively, there is a complex and confounding interaction between program composition/type, presenting problem and client characteristic (Hattie et al., 1997). This remains an area of ongoing research interest (Norton et al., 2014), and this research responds to this need by examining the relationship between participant risk factors and program outcomes.

Renowned practitioners and researchers in the wilderness-adventure discipline have called for the development of clear and consistent operational definitions of programs and interventions (Berman & Davis-Berman, 2001; Norton et al., 2014; Russell, 2001). Given that program composition/type has been identified as a moderator of program outcomes for youth-at-risk cohorts (Wilson & Lipsey, 2000), this research restricts itself to the understanding and evaluation of “intensive wilderness programming”. This has been defined by the author as “a clearly defined and structured group-based program that is delivered

within a remote or wilderness area, which is experienced by the participants as both physically and psychologically demanding (or intense in nature)". This operational definition has been developed in respect to three points. First, it captures the key programmatic and conceptual features of the Operation Flinders program (Mohr et al., 2001). Second, it brings a strong focus to an individual young person's internalisation or appraisal of their wilderness-adventure experience. Qualitative evaluations conducted by the author (Raymond & Lappin, 2016) and others (Luckner & Nadler, 1995) suggest that young people construct wilderness-adventure experiences markedly differently, with cultural background isolated as a potential moderator (Raymond & Lappin, 2016). Therefore, the definition supports a culturally inclusive and social constructivist approach (Vygotski, 1987). Finally, the operational definition is most closely aligned to the definition of "wilderness challenge programs" as defined by Wilson and Lipsey (2000). In their meta-analysis of wilderness programs for youth-at-risk participant cohorts, Wilson and Lipsey found that that the component of "program intensity" was associated with the largest program effect sizes (largest reduction in "delinquency" outcomes). They defined this as programs "that employ strenuous solo and group expeditions and other difficult physical activities" (Wilson & Lipsey, 2000, p. 8). The use of the "intensive wilderness program" definition is applied to delineate a cohort of wilderness interventions. While the term provides important delineation, notably to support the external validity of the research, it is noted that the term continues to remain a heterogeneous construct that includes a variety of interventions that vary as a function of program modality and content. Throughout the remainder of this chapter, the reader's attention is drawn to studies and research that meets this intensive wilderness programming definition.

Heterogeneity is also noted by significant between program variation in the inclusion and type of "therapeutic enhancement" strategies that occur either within or external to the

wilderness-adventure intervention (Wilson & Lipsey, 2000). That is, the degree programs include programmatic components or features based upon cognitive-behavioural therapy (e.g., Brand, 2001), family therapy (e.g., Pommier & Witt, 1995), clinically focused strategies (e.g., Russell, 2008) or therapeutic counselling and group processes (e.g., Russell, 2008). The inclusion of such strategies has been found to be a moderator of increased program effect for youth-at-risk cohorts (Wilson & Lipsey, 2000). Recently, the Northern Territory and South Australian Governments have funded an intensive wilderness camp that is embedded within a broader three month case management intervention (Raymond & Lappin, 2015, 2016). The inclusion of more than one therapeutic program component (e.g., wilderness camp and case management) under a single operational definition (e.g., intensive wilderness program) confounds program evaluations. Specifically, it raises questions in terms of the degree intervention effectiveness can be attributed to the wilderness-adventure program component alone.

In summary, the heterogeneous nature of wilderness-adventure programming requires the reader to bring a cautious and critical lens to the literature, and assess interventions in respect to their specific program components and features, the participant cohort and the inclusion and type of therapeutic enhancement program components.

3.1.2 Conceptual and Theoretical Underpinnings of Intensive Wilderness Programs

There is a diversity of theoretical perspectives that seek to explain the conceptual relationship between wilderness-adventure program processes and outcomes (Russell, 2000; Russell, 2006a). For example, they include intra-psycho processes (Beringer, 2004), attachment relationships (Bettmann & Tucker, 2011), socio-cultural processes (Brown, 2009), physical exercise (Caulkins, White, & Russell, 2006), rites of passage (Beames, 2004), challenges (Durr, 2009), metaphor and experiential learning (Gass, 1993a), wilderness setting (Rutko & Gillespie, 2013), therapeutic alliance and facilitation (Harper, 2009), narrative and

constructive processes (Luckner & Nadler, 1995; Stolz, 2000), and social/therapeutic community (Bell et al., 2014; Cook, 2008; Kennard, 2004; Sammet, 2010). Collectively, there is a lack of a unified model to understand the role, function and diversity of stated outcomes (Norton et al., 2014; Russell, 2000). Mohr et al. (2001), in a broad review of wilderness programming for youth offender contexts, reported that the theoretical underpinnings of wilderness programs are “frequently neither clearly articulated, well founded, nor convincing” (p. 50). In part, this can be explained by an overreliance on outcome based research (Baldwin, Persing, & Magnuson, 2004; Hattie et al., 1997), as opposed to process or theory informing evaluation (Norton et al., 2014; Russell, 2000; Russell & Phillips-Miller, 2002). There is an identified case for process-outcome evaluations (Norton et al., 2014), with program evaluations guided by a “theory-program-outcome” perspective, that includes the assessment of both immediate (or proximal) and distal outcomes (Baldwin et al., 2004). Applying theory to descriptively operationalise program modelling has been widely articulated within the literature (Nichols, 2000; Norton et al., 2014; Russell, 2006a; Russell & Phillips-Miller, 2002). In response to these points, in the main study of this research, a recognised theoretical model (Transtheoretical Model, see chapter 4) is operationalised within an evaluation assessing both immediate and distal program outcomes.

It is beyond the scope of this chapter to provide a detailed summary of the conceptual and theoretical underpinnings of wilderness-adventure programs for youth-at-risk cohorts. The reader is encouraged to read a summary review (see Davis-Berman & Berman, 1994b; Gass, 1993b; Mohr et al., 2001; Raymond, 2003). For the purpose of this research, it is concluded that wilderness programs are likely to achieve beneficial outcomes for youth-at-risk client groups for the following reasons. These points have been adapted from Mohr et al.

(2001, p. 50), but reworded with consideration to the positive youth development literature (e.g., Lerner et al., 2003):

- They remove the participant from a dysfunctional environment and thus the influences and contingencies that restrict the young person's capacity to thrive or build their developmental assets;
- They expose the participant to circumstances in which well-established beliefs, values and dysfunctional behaviour patterns are no longer viable;
- They create an uncomfortable or uncertain internal state (e.g., dissonance) – thus increasing the individual's susceptibility to the influence of adults that role-model coach and support the growth of developmental assets;
- They utilise a therapeutic community – i.e., a supportive group setting – in order to enhance the process of change.

This psychosocial model brings a strong focus to psychological processes underpinning change, which is consistent with the recognition that psychology has a key role to understand and inform wilderness-adventure interventions (Mackenzie, Son, & Hollenhorst, 2014).

However, the application of the positive youth development constructs to conceptualise and evaluate wilderness-adventure programs remains underdeveloped within the literature. Apart from isolated examples (Deane & Harré, 2014; Neill, 2008; Norton & Watt, 2013; Passarelli, Hall, & Anderson, 2010; Russell, 2006b), there is a paucity of studies that have explored the processes and outcomes of wilderness-adventure programs through a positive psychology or positive youth development framework. In this research, the application of the Life Buoyancy Model to operationalise the program evaluation framework (Chapter 5, Table 5.1) for the main study addresses this research gap.

3.2 Wilderness Programming Outcome Research

This section summarises the evidence supporting the role and effectiveness of wilderness-adventure programs. A number of reviews have highlighted the lack of methodologically sound program evaluations within the literature (Bedini & Wu, 1994; Hattie et al., 1997; Heseltine et al., 2003; Mohr et al., 2001; Newes, 2001; Norton et al., 2014; Wilson & Lipsey, 2000). This has been an impediment to the development of the discipline (Berman & Davis-Berman, 2001; Crisp, 2003), with “rigorous intervention research” remaining an area of need (Norton et al., 2014). The author’s review revealed there was a paucity of intervention research within higher impact journals, or evidence of strongly controlled outcome evaluations. There was evidence of numerous evaluations failing to control for repeat testing effects or relying on non-validated instruments (for example Bowen & Neill, 2015; Brand, 2001; Gillespie & Allen-Craig, 2009; Wang, Liu, & Kahlid, 2006). A number of spurious claims about program effectiveness have been made through such evaluations, and this has been a barrier to the modality’s acceptance within the wider literature (Crisp, 2003). While noting this point, a number of wilderness-adventure researchers have highlighted the complexity in conducting reliable observational studies (Larivière et al., 2012) and randomised controlled trials (Gabrielsen, Fernee, Aasen, & Eskedal, 2015). Gabrielsen et al. described a range of ethical, practical and empirical barriers that led the research team to abandon the use of a control or comparison group for a large scale evaluation of an outdoor-wilderness program in Norway.

A key barrier to methodologically rigorous research is the lack of clearly articulated and operationalised program models (Gass et al., 2012). Norton et al., (2014) suggested that “without clearly describing models and therapeutic processes, researchers cannot be sure that the changes measured are indeed due to interventions or to other variables. This is because researchers cannot fully measure the fidelity of the program models” (p. 52). Program fidelity

remains a key area of concern for program developers to understand and monitor, and for wilderness-adventure researchers to assess routinely (Tucker & Rheingold, 2010), and it is a best-practice principle of program development identified in Chapter 2. Apart from an isolated paper by Tucker and Rheingold, program fidelity/integrity has not been systematically explored or discussed within the wilderness-adventure literature.

In summary, there is a need for strongly controlled evaluations of wilderness-adventure programs that are informed by a clearly defined theoretical framework and program model, with assessment and monitoring of program fidelity. In reflection of this point, the design and implementation of the research methodology (see Chapter 5) has been underpinned by a theoretical model (Transtheoretical Model, see Chapter 4) and an evaluation framework mapped to the Operation Flinders program model (see Table 5.1, Chapter 5).

3.2.1 Meta-Analytic Reviews

A number of meta-analytic reviews of wilderness-adventure programs have been conducted (for review of meta-analyses see Bowen & Neill, 2013; Neill, 2003; Neill & Richards, 1998)⁶. In the following sections of the thesis, meta-analytic data specific to offending, educational disengagement and wellbeing outcomes are summarised. Across the meta-analyses, interventions effects cluster on the medium effect size ($0.4 < d > 0.5$) (Bowen & Neill, 2013; Neill, 2003; Norton et al., 2014), and Norton et al. have identified this as the benchmarked effect size for outdoor-wilderness programs⁷. However, effect size between .30 and .5 are more typical for programs targeting 9 to 17 year old participants (Bowen & Neill, 2013). The internal validity of meta-analytic studies within the wilderness-adventure discipline is questioned for a number of reasons. First, interventions captured in the meta-

⁶ Meta-analytic techniques are a statistical method of combining the results of a large number of empirical studies. The results can be considered quite robust.

⁷ Cohen's *d* (effect size) is a standardised measure of the difference between two means. Small, medium and large effect sizes are denoted by $d = .20$, $d = .50$ and $d = .80$, respectfully (Cohen, 1992).

analyses are notably heterogeneous in nature, comprising young people with distinct characteristics and behavioural profiles, and programs with large variations in program length, intensity and therapeutic underpinnings. Given that program fidelity is not routinely assessed within evaluation (Tucker & Rheingold, 2010), the degree the meta-analysis is assessing program impact specific to the wilderness-adventure intervention cannot be reliably delineated. For example, Wilson and Lipsey (2000) conducted a meta-analysis of behavioural outcomes specific to studies that employed a control or comparison group for youth-at-risk. They found that the inclusion of therapeutic enhancement techniques (e.g., CBT skills training, family therapy) accounted for significant variability in outcome effect sizes. Second, Neill (2003) reported that published wilderness data may only represent 1% of existing programs, which compromises the representativeness of meta-analytic studies. Third, in a review of programs, Hattie et al. (1997, p. 70) reported that “only some adventure programs are effective, and then on only some outcomes, and it is probable that only parts of the programs are influencing those outcomes”. In respect to this last point, there is wide effect size variability reported within meta-analytic studies (Bowen & Neill, 2013; Cason & Gillis, 1994; Hattie et al., 1997), with one meta-analysis finding a significant relationship between lower quality studies and higher treatment effect size (Cason & Gillis, 1994). However, this was not replicated within a recent meta-analysis (Bowen & Neill, 2013).

In respect to the points noted, Raymond (2014) argued that wholesale conclusions regarding the effectiveness, or lack of effectiveness, of intensive wilderness programs for youth-at-risk is not supported. Instead, he argued, the effectiveness of wilderness interventions needs to be assessed on a case-by-case basis, in respect to a rigorous evaluation methodology, and an evaluation framework mapped to a clearly conceptualised program model. The following sections summarise outcome research specific to offending, educational disengagement and wellbeing domains. Given the previous points, individual

studies should be critically evaluated in respect to the evaluation method, program composition and participant profile. As it is beyond the scope of this research for this to occur, the reader should interpret the following outcome results as indicative trends.

3.2.2 Offending Outcomes

There is optimism that outdoor-wilderness programs can deliver meaningful crime prevention outcomes (Bailey & Ray, 1979; Bandoroff, 1989; Mason & Wilson, 1988), specifically interventions that include therapeutic enhancement and aftercare components (AIC, 2006). There is a range of challenges and risks in delivering wilderness programs for young people at risk of offending (for case studies see Collis & Griffin, 1993; Raymond & Lappin, 2016), including the potential for programs to evoke negative psychosocial and behavioural outcomes for some young people (Raymond & Lappin, 2016).

While a number of studies report outcomes related to reduced offending or recidivism (Baer, Jacobs, & Carr, 1975; Clagett, 1989; Gillis & Gass, 2010; Lan, Sveen, & Davidson, 2004), equally, other studies find no such effects (Deschenes & Greenwood, 1998; Jones, Lowe, & Risler, 2004; Russell & Walsh, 2011). In a strongly controlled study, Castellano and Soderstrom (1992) found one-year differential improvements in recidivism for wilderness program participants, however, the differential effects were not observed at the two-year follow-up. Meta-analytic studies provide support that wilderness-adventure programs can manifest in a small reduction in recidivism (Bedard, 2004; Wilson & Lipsey, 2000). Wilson and Lipsey⁸ reported a small treatment effect on recidivism outcomes ($d = 0.18$), indicating that 29% of wilderness participants recidivate, compared to 37% of control

⁸ This meta-analysis demonstrates strong internal validity. It included 28 studies that had a control or comparison group with evidence of pretest equivalence. While a number of meta-analyses are reported in this thesis, this study demonstrates the strongest external validity. That is, the meta-analyses was restricted to “wilderness challenge programs” that included both a physical challenge and interpersonal element which were designed for youth between 10 and 21 presenting with antisocial or delinquent behaviour.

participants. They also reported that wilderness-adventure programs were related to a small reduction in anti-social behaviour ($d = 0.24$).

In reviewing the wilderness-adventure literature and offending outcomes, Heseltine et al. (2003) reported that “the efficacy of wilderness-adventure programs for at-risk youth may be able to be more accurately determined if researchers used dynamic predictors of recidivism (criminogenic needs) as dependent variables” (p. 238). In reflection of this point, the University of South Australia Forensic and Applied Psychology Research Group conducted a pretest-posttest control group evaluation of the Operation Flinders program applying criminogenic dependent variables, including anger/aggression, criminal attitudes/cognitions and classroom behaviour (Mohr et al., 2001). Mohr et al reported that the intervention offered meaningful program effects for young people with the highest level of need (e.g., highest aggression, most negative attitudes), indicating that the program could reduce future offending risk for this cohort.

Despite the optimism noted, within the broader criminological and forensic psychology literature, wilderness-adventure programs are not universally regarded as an evidence-informed crime prevention intervention (Guerra, Kim, & Boxer, 2008; Reddrop, 1997; Sallybanks, 2003). An Australian Institute of Criminology (AIC) commissioned review reported low evidence for the effectiveness of wilderness interventions, in comparison to other interventions where there was a stronger body of evidence (e.g., cognitive behaviour therapy, skill-based interventions and multi-systemic therapy) (Sallybanks, 2003).

3.2.3 Educational Outcomes

Across Australia (e.g., Bowling & Williams, 1993; Mohr et al., 2001) and internationally (Dolgin, 2014; Romi & Kohan, 2004), wilderness-adventure programs have been designed for young people at risk of school drop-out and educational disengagement. In a recent meta-analysis, Bowen and Neill (2013) reported that 10.2% of the collective

participant sample (including programs for adults and adolescents) fitted the “educationally disengaged” category. Wilderness-adventure programs are associated with positive attitudinal and behavioural outcomes, on measures conceptually related to educational disengagement, at least within the short-term (Mohr et al., 2001; Raymond, 2003). Specifically, Raymond found that young people who were at the highest risk of educational disengagement (as assessed by a history of pre-program school suspensions and truanting) achieved the largest program effect sizes.

A number of meta-analyses have operationalised educational outcomes under the categories of “academic” (Bowen & Neill, 2013; Hattie et al., 1997), “school adjustment” (Wilson & Lipsey, 2000), “grades” and “school attendance” (Cason & Gillis, 1994). The operational definition for each construct is not descriptively reported in the reviews. Given all four meta-analyses also coded outcomes on a “behavioural” domain, which is defined by Bowen and Neill as the “capability of a person to act within and adjust to their environment” (p. 30), it is quite possible that behavioural outcomes conceptually or empirically related to educational disengagement have been collapsed within this broader behavioural measure. Thus, educational outcomes should be assessed alongside the evidence reported in the wellbeing and offending sections of this chapter.

In the meta-analysis most relevant to this research, Wilson and Lipsey (2000) found that wilderness programs for young people at risk of “delinquency” were related to a small improvement in school adjustment ($d = 0.30$). Other meta-analyses demonstrated stronger effect sizes, specific to grades ($d = .61$) and school attendance ($d = .47$) (Cason & Gillis, 1994), and academic outcomes ($d = .41$) (Bowen & Neill, 2013). Collectively, while there is consistent evidence supporting the efficacy of wilderness-adventure programs for young people at risk of educational disengagement (in the short-term), there is a paucity of longitudinal and strongly controlled research specific to behavioural outcomes. This research

responds to this need by exploring longitudinal program effects related to behavioural outcomes (e.g., suspension/exclusion, school attendance).

3.2.4 Wellbeing Outcomes

Wilderness-adventure programs have been applied across a diverse number of wellbeing settings; ranging from youth presenting with severe psychiatric, emotional or clinical needs (e.g., Autry, 2001; Clagett, 1989) to student populations targeting enhanced social-emotional and coping responses (e.g., Wang et al., 2006). Specific program objectives reported in the literature load on the wellbeing constructs of resilience (Beightol, Jevertson, Carter, Gray, & Gass, 2012; Gillespie & Allen-Craig, 2009), coping (Dolgin, 2014; Norton & Watt, 2013), life effectiveness (McLeod & Allen-Craig, 2007; Neill, 2008), social development (Sammet, 2010), and spirituality, identity and purpose (Duerden, Taniguchi, & Widmer, 2011; Ungar, Dumond, & McDonald, 2005). Across North America, wilderness program participants are increasingly presenting with substance use problems (Hoag, Massey, & Roberts, 2014), and North America is at the forefront of the development of clinically focused wilderness-adventure programs (e.g., titled Outdoor Behavioral Healthcare) targeting wellbeing, mental health and substance use outcomes (Russell, 2003; Russell, 2005; Russell, 2008). These longer-term interventions, up to three months, bring a strong clinical focus and include non-voluntary client groups. Across Australia (Crisp & O'Donnell, 1998) and internationally (e.g., Berman & Davis-Berman, 1991; Hill, 2007; Williams, 2000) mental health treatment interventions have been embedded within wilderness-adventure programming.

There is a strong body of evidence that wilderness-adventure programs can deliver meaningful wellbeing outcomes (see review by Pryor, 2009). Key programmatic features of intensive wilderness programs are individually associated with enhanced wellbeing. That is, there is a positive relationship between an individual's engagement with nature and enhanced

wellbeing (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Weinstein, Przybylski, & Ryan, 2009) and physical activity is associated with a range of positive social, emotional and wellbeing outcomes (Lubans, Plotnikoff, & Lubans, 2012). At the program level, wilderness-adventure programs have demonstrated effectiveness for young people with severe mental health (Berman & Davis-Berman, 2013; Clark, Marmol, Cooley, & Gathercoal, 2004; Davis-Berman & Berman, 1989) and emotional disturbances (Russell, 2003). Across three meta-analyses, clinically focused outcomes range from the small to large effect size ($d = .43$, $d = 1.05$ and $d = .25$, Bowen & Neill, 2013; Cason & Gillis, 1994; Wilson & Lipsey, 2000); indicating high levels of between program variability in intervention effectiveness. In a recent meta-analysis of clinically based wilderness interventions for private pay clients, with a focus on North American programming (Outdoor Behavioral Healthcare), the effect sizes clustered on the medium effect size (Bettmann, Gillis, Speelman, Parry, & Case, 2016).

Across the literature more broadly, participant self-concept (self-efficacy, self-esteem and locus of control) has been widely applied as a dependent variable within outcome research (Russell, 2000). Meta-analytic reviews (Bowen & Neill, 2013; Hans, 2000) and individual studies indicate that wilderness-adventure programming is associated with increased self-efficacy (e.g., Beightol et al., 2012), self-esteem (e.g., Herbert, 1998; Hogan, Ireland, & Lloyd-Jones, 1994; Romi & Kohan, 2004; Wang et al., 2006) and internality, or stronger identification with an internal locus of control (e.g., Herbert, 1998). Equally, positive self-concept outcomes have not been replicated in other program evaluations (Larson, 2007; Orren & Werner, 2007). Meta-analyses demonstrate a pattern of small to medium effect sizes related to self-concept ($d = .43$ and $d = .34$, Bowen & Neill, 2013; Cason & Gillis, 1994, respectively), locus of control ($d = .43$, $d = .34$, $d = .38$ and $d = .10$, Bowen & Neill, 2013; Cason & Gillis, 1994; Hans, 2000; Wilson & Lipsey, 2000), self-esteem ($d = .31$, Wilson & Lipsey, 2000), and interpersonal relationships and/or social skills ($d = .42$ and $d = .28$, Wilson

& Lipsey, 2000). Collectively, wilderness-adventure meta-analytic reviews demonstrate high levels of effect size variability across wellbeing and self-concept measures (Norton et al., 2014), and a number of studies indicate that outcomes do not occur uniformly across multiple wellbeing dependent measures within the one study (Beightol et al., 2012; Norton & Watt, 2013).

3.2.5 Evaluation Summary

In summary, wilderness-adventure programs are associated with small (Wilson & Lipsey, 2000) to medium (Norton et al., 2014) effects for youth at risk of offending, educational disengagement and poor wellbeing. However, given the heterogeneity of programming, and the large effect size variability noted within meta-analytic studies, wholesale generalisations regarding the effectiveness, or lack of effectiveness, of intensive wilderness programs for youth-at-risk are not supported (Raymond, 2014). There is a need for “research to compare youth with different demographic and presenting issues to see if AT [adventure therapy] is more or less effective with certain populations” (p. 52). The current research responds to this need by stratifying the evaluation of short- and long-term program outcomes based upon risk factors predictive of future offending, educational disengagement and poor wellbeing.

3.3 Sustainability of Program Outcomes

One of the strongest challenges to the wilderness discipline relates to the long-term sustainability of participant outcomes (Bandoroff, 1989; Mason & Wilson, 1988). There are a number of studies suggesting that participant outcomes regress back to pre-test levels of functioning upon a participant returning to their home environment (e.g., Davis-Berman & Berman, 1994a; Deschenes & Greenwood, 1998; Durgin & McEwen, 1991; Herbert, 1998; Pommier & Witt, 1995; Weston et al., 1999). In contrast, there is also evidence of outcome durability within the literature (Bettmann et al., 2013; Harper, Russell, Cooley, & Cupples,

2007; Hattie et al., 1997; Russell, 2003). Hattie et al. (1997) conducted a meta-analysis of outdoor education programs for adolescents and adults and reported evidence of continued gains ($d = .17, ns$) in the post-program period. While this finding has not been replicated (Bowen & Neill, 2013), in their recent meta-analysis, Bowen and Neill indicated that “changes are retained over the longer-term” (p. 40). Qualitative evaluations of Australian-based intensive wilderness programs for youth at risk of offending have identified a theme of attitudinal/behavioural regression in the immediate post-program period for some, but not all, program participants (Raymond & Lappin, 2011; Raymond & Lappin, 2015, 2016). Durgin and McEwen (1991) suggested that participant changes “are soon lost in the struggle against poor family interactions and negative community environments” (p. 34). Consolidating outcomes remains an important focal area for program developers (Davis-Berman & Berman, 1994a, 1994b), with post-program follow-up a key program component of “successful” programs (Brand & Smith, 1999) and a best-practice criterion for wilderness-adventure programming, more generally (AIC, 2006; Raymond, 2014). However, internationally, the operationalisation and resourcing of follow-up services differs markedly across wilderness-adventure program providers (Pointon, 2013).

3.4 Intensive Wilderness Programs as a Catalyst for Change

The chapter to date indicates that while wilderness-adventure programs may be effective in eliciting small to medium outcomes for youth-at-risk, questions regarding outcome sustainability exist within the literature. In other words, wilderness-adventure programs may elicit but not consolidate change, thus they could be described as having a catalytic effect. The “catalyst for change” descriptor frequently appears in both journal and program marketing documentation related to wilderness-adventure programs. This includes within summary descriptions of program effects (e.g., Mohr et al., 2001; Raymond, 2004; Stolz, 2000; Sveen, 1999), the way in which program activities moderate participant growth

or change (Brand, 2001; Newes & Bandoroff, 2004) or the thematic descriptors researchers apply to participant reflections of wilderness programs (Revell, Duncan, & Cooper, 2014). Interestingly, the 10th National Outdoor Education Conference held in Sydney (Australia) in 1997, was titled “Catalysts for Change”.

A reported strength of wilderness-adventure programming is the modality’s capacity to engage youth-at-risk within a predominately fun, novel and interesting experience, and through this process, be a catalyst for prosocial attitudinal or behaviour change (Berman & Davis-Berman, 1991). In his summation of two historical evaluations of the Operation Flinders program (Mohr et al., 2001; Raymond, 2003), Raymond (2004) reported:

Wilderness therapy affords the opportunity to both work with and overcome many of the barriers associated with the engagement of marginalised youth. It provides a ‘window of opportunity’, or catalyst for change, by which young people can be engaged and sustained within a therapeutically conducive environment that is advantageous to future positive outcomes. (p. 5)

The “catalyst for change” descriptor frequently appears in online searches of Australian and international wilderness programs. Table 3.1 summarises the results of an internet search applying the words “catalyst for change”, “wilderness” and “youth”.

Table 3.1

Summary of Internet Search of “Catalyst for Change” Descriptor

Descriptor	Agency and Program Location	Web or URL Address
“The Wilderness experience provides a catalyst for change and self-reflection for young people aged 14-18”	Social and Community Health, Victoria, Australia	http://www.each.com.au/images/_service_brochures/EACH_YFS_Brochure.pdf
“Power of wilderness experiences as a catalyst for change in young offenders”	University of Essex, United Kingdom	http://www.sciencedaily.com/releases/2009/01/090105091536.htm
“Rites of Passage is a catalyst for change, helping troubled youth make a meaningful difference in their own lives.”	Rites of Passage, Shelton, Washington	http://ritesofpassagewildernesstherapy.com/about-rites-of-passage/
“Wilderness therapy has many benefits, one of which is that it gets adolescents and young adults out of their current environment and into one that acts as a catalyst for change.”	Pacific Quest, Hawaii	http://www.pacificquest.org/blog/2014/03/31/choosing-change-wilderness-therapy-for-your-troubled-adolescent/
“Our programmes are a catalyst for change”	Venture Trust, Edinburgh	http://www.venturetrust.org.uk/

Note: Search conducted with Google search engine (Internet Explorer browser) on the 5th January 2016.

Despite its frequent use, the “catalyst for change” descriptor has not been systematically operationalised to assess the processes and outcomes of change specific wilderness-adventure interventions. Within Chapter 4, the construct is operationalised applying the Transtheoretical Model (TM); which is a stage-based model assessing motivational constructs (Prochaska et al., 1992). In support of the role of motivational constructs, qualitative and quantitative evaluations indicate that wilderness-adventure programs can enhance participant motivation: (1) for generalised change (Bowen & Neill, 2015), (2) to engage with external therapy processes (Hoag et al., 2013) and support self-

disclosure (Hill, 2007), (3) to engage in prosocial behaviour (Pointon, 2011; Raymond & Lappin, 2011; Raymond & Lappin, 2015) and (4) to take action to reduce substance use (Bettmann et al., 2013; Russell, 2008; Tucker, Bettmann, Norton, & Comart, 2015).

Through a systematic search, the author isolated three articles within the wilderness-adventure literature that applied tools operationalising the TM within program evaluation. These evaluations were related to an eight-week clinically focused wilderness program for youth presenting with severe substance abuse problems (Bettmann et al., 2013; Russell, 2008; Tucker et al., 2015). Russell (2008) assessed motivation to change across the pre- and post-program periods applying the University of Rhode Island Change Assessment (URICA)⁹. At the pre-treatment phase, he found that 27% of participants were in the action stage of change (as operationalised by the Transtheoretical Model, see Prochaska et al., 1992), while at discharge, 90% of the youth were in the action or maintenance stages, indicating the intervention had improved their willingness to commit to change. In a related study, applying a similar intervention type and cohort, Bettmann et al. (2013) found that pre-intervention motivation to change (assessed by URICA) was not associated with subsequent intervention outcomes, indicating that both resistant (or unmotivated youth) and motivated clients received similar intervention outcomes. A recent study found that both pre-intervention motivation to change (URICA), and changes in motivation to change across the pre- and post-intervention periods, was not associated with intervention outcomes specific to an eight-week clinically focused wilderness intervention (Tucker et al., 2015). In summary, in the past decade there has been increasing interest in the TM within the wilderness literature (Norton et al., 2014). However, this has been restricted to clinically focused and longer-term North American wilderness-adventure programs for youth presenting with substance abuse problems. In all three reported studies, a large number of the youth were involuntary clients

⁹ This instrument, along with the Transtheoretical Model, is described in detail in Chapter 4.

(not consenting to participate in the intervention). Therefore, the generalisability of the results to shorter and non-clinically focused intensive wilderness programs for volunteer youth, or for cohorts external to North America, remains unknown. This research responds to this need by examining motivational constructs for an Australian participant group (volunteer) presenting with diverse risk factors related to offending, educational disengagement and poor wellbeing.

Exploratory application and analysis of the TM for Australian-based intensive wilderness programs has occurred over the past decade. In a pilot study, Raymond (2003) included motivation to change as a process variable within a pretest-posttest evaluation of the Operation Flinders program. He found that higher levels of participant pre-program motivation were associated with a consistent pattern of larger (but non-significant) program effective sizes ($p > .05$). As an extension of this piloting, and applying TM to operationalise the analysis, Raymond and Lappin (2011) conducted a mixed method evaluation of three intensive wilderness-adventure programs for youth-at-risk in the Northern Territory (Australia). The authors concluded:

The camp programs can stimulate young people to move from pre-contemplation to contemplation of change, as well as engaging in some action towards creating that change. (p. 296)

Raymond and Lappin (2011) developed and piloted a tool tapping motivational constructs (self-efficacy, willingness to engage help-seeking relationships & problem awareness). However, owing to a small sample size, the measure's psychometric properties remained unknown. Pointon (2011) subsequently applied the measure within a pretest-posttest control group design evaluation of the Operation Flinders program. Participants attending the program (compared to controls) had differential and statistically significant improvements in their willingness to make positive future changes. Raymond and Lappin (2015, 2016) used the TM as the theoretical framework to support the design and development of two intensive wilderness programs within the Northern Territory.

Independent evaluation of these programs, and utility of the TM within this context, has not occurred.

In summary, there is emerging evidence that wilderness-adventure programs can enhance a young person's motivation for prosocial and health-focused behaviour change, and the Transtheoretical Model appears to offer utility to explain and understand this process, including providing a theoretical model to guide program development. However, the systematic operationalisation of the model to evaluate the effectiveness of intensive wilderness programs for young people at risk of offending, educational disengagement and poor wellbeing has not occurred. This research responds to this need.

3.5 Operation Flinders

Operation Flinders was founded as a “behaviour circuit breaker” for at-risk youth (Murray-White, 1994). While the program was precipitated by a founder's vision and energy, it has been refined and stabilised through a consistent leadership and governance structure (Raymond & Lappin, 2016). On its website, Operation Flinders refers to itself as a wilderness-adventure program for “young men and women who have been identified as being at risk, with demanding outdoor challenges and support, to help them develop their personal attitudes and values of self-esteem, motivation, team work and responsibility so they may grow as valued members of the community.”¹⁰ Core objectives of the program are to:

- “Effect a positive life change for young people at risk by improving self-esteem and confidence, improving the rate of return to education and encouraging young participants to seek employment.
- Reduce the recidivism rate of young offender participants.”

¹⁰ Operation Flinders Mission Statement. Retrieved from <http://www.operationflinders.org.au/AboutUs/Aims.aspx> (dated 16/1/2014)

In short, the program's target cohort is young people at risk of future offending, educational disengagement and poor wellbeing (as operationalised through the constructs of "self-esteem" and "confidence").

3.5.1 Program Details

Operation Flinders is an eight-day intensive wilderness program that is conducted in the Northern Flinders Ranges (South Australia) five times per year. Volunteer participants form teams of between 8 and 10 that are established by referral agencies in conjunction with Operation Flinders leadership. Each team travels independently to the Operation Flinders program area (Yankaninna Station), where they are met by Operation Flinders program staff. Each team walks a 100km circuit and carries a backpack containing sleeping/camping equipment, personal items, water and a limited supply of food. On each day, teams walk to designated night locations (or stands) where they are resupplied with rations and water. The participants carry small, one-person, open sided tents which are erected to provide shelter from the elements.

All team members are taught basic bushcraft, map reading and navigation under the guidance of their *Team Leader* (contracted Operation Flinders staff member). Team members are responsible for cooking, building the fire and other duties required to maintain a camp. Over the eight days the team walks in a predetermined route over rugged and undulating terrain, finishing in the vicinity of where they started. The distance of daily walks varies, depending on the activities co-occurring on individual days (ranging from 6km to 22kms). Teams interact with Operation Flinders field staff at three night locations, and become involved in specific activities that support the outcomes of the program (e.g., cultural activities, abseiling, bush survival and team challenges).

Operation Flinders has been designed as a physically and psychologically intense stand-alone program. During the program, it is reported that Operation Flinders and referral

agency personnel support participants to process the intensive wilderness experience, as well as reflect upon their life and choices; challenge dysfunctional attitudes and behaviours; and set pro-social goals for the future. The psychologically demanding nature of the program, specifically for program facilitators, has been assessed and reported by Lawrence-Wood and Raymond (2011).

Since 2008, Operation Flinders has received funding to employ a worker to guide and support post-program follow-up. Operation Flinders leadership have indicated this role has led to the provision of: (1) post-program adventure-based activities, (2) enhanced program integration with external agencies, (3) educational resources and training to participants and (4) internet technology within the follow-up process. There has also been increased emphasis on the peer-group mentor program which supports nominated past participants to receive training and education to return to the program and provide peer mentoring.

In summary, Operation Flinders befits the definition of an intensive wilderness program. There is consistent qualitative evidence that the program is assessed by participants and facilitators as psychologically and physically challenging (Lawrence-Wood & Raymond, 2011; Mohr et al., 2001; Raymond & Lappin, 2015, 2016). It represents a clearly defined and structured group-based program, delivered in a remote location, where the program components have changed little over the program development cycle (e.g., at its broadest level young people still complete a 100km trek over 8 days). The stability of the program delivery, over a 20 year period, provides the conditions for robust program evaluation to occur (Royse et al., 2010).

3.5.2 Operation Flinders Integration with Referral Agencies

Young people are referred to the program through schools, government and non-government agencies (known collectively within this report as referral agencies). Each referral agency is responsible for the recruitment, screening and organisation of young people

to travel to the Operation Flinders program area. Each agency is afforded the opportunity to recruit between 5 and 10 young people, which is supported by at least one adult (e.g., teacher, counsellor, youth worker) selected from the referral agency. These adults are referred to as “counsellors” and have a role to support and guide participants to process and complete the program, and prepare and support young people both during and after the program, including the integration of the Operation Flinders’ experience into their daily lives.

Through engaging with key personnel from referral agencies in the evaluation process, the author has formed the viewpoint that there are wide differences between referral agencies in the:

- Selection and recruitment protocols used to select participants.
- Level of preparation provided to participants prior to the program. There was evidence that Operation Flinders was being used by some referral agencies as one component of an integrated or longitudinal intervention, while for other agencies, it was applied as a stand-alone intervention.
- Type and intensity of support provided to participants both during and following the wilderness experience.

Given this heterogeneity, a core applied outcome of the research was to identify selection criteria to assist both Operation Flinders and referral agencies to recruit participants most likely to benefit from the program.

3.5.3 Operation Flinders Conceptual Model (Program Logic)

The integration of theory to descriptively operationalise program modelling remains an important consideration for wilderness-adventure program development (Baldwin et al., 2004; Nichols, 2000; Norton et al., 2014; Russell, 2006a; Russell & Phillips-Miller, 2002). Reflecting this point, Raymond (2014) reported that a best-practice benchmark of intensive wilderness programs, as a youth crime prevention strategy, is the articulation of “a clear,

therapeutically aligned and documented program model that includes a hierarchy of criminogenic needs and outcomes, and a clear evidence-informed program logic which details the program processes to achieve those outcomes”.

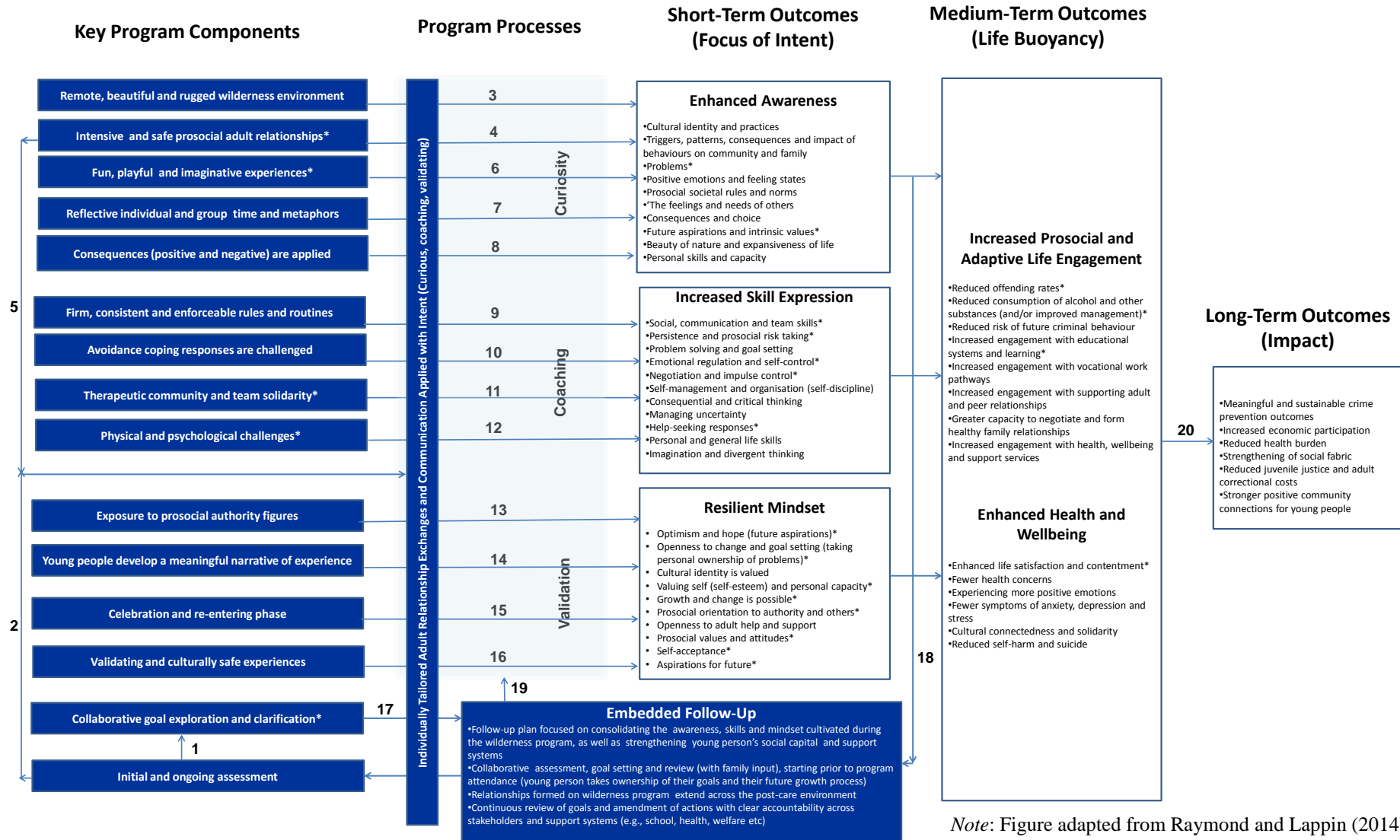
At the point of research planning, a conceptual model or program logic for the Operation Flinders program did not exist. Bamberger et al. (2012) suggested that program evaluators should work with programmers and stakeholders to develop a program logic and theory prior to conducting an evaluation, with the monitoring of program fidelity (or actual delivery against the program model) a best-practice consideration for wilderness-adventure outcome research (Tucker & Rheingold, 2010). There is an argument that rigorous impact evaluations should only occur after there is a well-developed and falsifiable program logic in place (Epstein & Klerman, 2012). While it was beyond the scope of the research for this to occur, unrelated to the research, the author and colleague (Raymond & Lappin, 2015) were contracted by the Northern Territory Government to develop a program logic for a wilderness-adventure program delivered by Operation Flinders in the Northern Territory.¹¹ Subsequent to this, Operation Flinders leadership endorsed this program logic as the conceptual model for the South Australian program which was evaluated within the main study of this research.

Figure 3.1 summarises the Operation Flinders program logic. The conceptual and categorising framework for this logic modelling is the Life Buoyancy Model, as articulated in Chapter 2. This program logic (Figure 3.1) has been truncated as the evaluation framework (Table 5.1, Chapter 5) that was subsequently operationalised through the research methodology. The program logic has been reproduced in this chapter to support the reader understand the conceptual linkages between the positive psychology and PYD literature

¹¹ The Northern Territory is a separate Territory (or State) from Operation Flinders’ principal program location and referral source of South Australia. While this Northern Territory program is founded upon similar program components as the South Australian delivered program, it articulates and benchmarks a prescriptive set of post-camp program components (including case management). This program logic was developed in 2014.

(operationalised through the Life Buoyancy Model, Figure 2.1), the Operation Flinders program logic (Figure 3.1) and the evaluation framework (Table 5.1). No attempt is made within this research to systematically evaluate the Life Buoyancy Model or the Operation Flinders program logic. Instead, the research provides a background case study demonstrating how positive psychology constructs and modelling can be operationalised across program development and evaluation.

In reference to Figure 3.1, the column “key program components” (black boxes) details the specific activities and participant experiences delivered as part of the Operation Flinders program. The column “program processes” articulates the key therapeutic processes by which change is cultivated through the program. That is, young people are expected to be engaged in experiences that are experienced as validating, evoke curiosity and coach them to build their skill capacity. The program logic identifies a hierarchy of short, medium and long-term outcomes. The short-term outcomes are the immediate focus of intervention, and include enhancing participant insight (or awareness/knowledge), increasing skill expression and cultivating a resilient mindset. These short-term outcomes have an evidence-informed or predictive relationship with the medium-term outcomes, which include increasing positive life engagement (e.g., reducing offending, increasing school engagement), and health and wellbeing outcomes. Subsequently, these medium-term outcomes are predictive of the desired program impact or long-term outcomes (e.g., sustainable crime prevention outcomes).



Note: Figure adapted from Raymond and Lappin (2014).

Figure 3.1 Operation Flinders Program Logic

3.5.4 Outcomes of Operation Flinders

The Operation Flinders program is one of the few intensive wilderness programs within Australia that has undergone both ongoing and rigorous evaluation. This section summarises the program's evaluation history. The South Australian Attorney General's Department commissioned the Forensic and Applied Psychology Research Group of the University of South Australia to conduct an evaluation in 2001 (Mohr et al., 2001). Mohr et al. initially sought to undertake a retrospective analysis of participant offending behaviour and outcomes. However, owing to an inability to isolate a suitable control group, the authors concluded that the "scope conditions for a valid study of long-term outcomes of OF (Operation Flinders) participation were found not to exist" (p. 65).

In response, Mohr et al. (2001) applied a pretest-posttest control group design to examine the effect of the program on participant self-esteem, anger, criminal cognitions and classroom behaviour. The authors chose specific criminogenic needs that were predictive of offending behaviour. The comparison of pretest-posttest shifts between the participant and control group revealed no significant differential improvement pattern in favour of the participant group. However, when high-need individuals were isolated, that is, "individuals scoring in that half of a scale's score range that might be classed as indicative of dysfunction" (p. 149), a differential pattern of results emerged. Among these respondents, completion of the program, relative to non-attendance, was related to significant improvements in self-esteem, angry feelings, attitudes towards the police, cognitive neutralisation of offending, and identification with criminal others. The only self-report measure to show no effect for Operation Flinders participation assessed aggressive impulses.

Mohr et al. (2001) used the Behavioral Academic Self-Esteem (BASE) questionnaire to assess the effect of the Operation Flinders program on classroom behaviour; operationalised as increased self-confidence, coping ability and self-esteem within the

classroom setting. Relative to controls, the participant group recorded significant improvements on all five of the BASE's subscales, including: social attention, coping with success and failure, social attractiveness, student initiative and self-confidence. When high need individuals were isolated, the improvements were more pronounced.

Mohr et al. (2001) provided evidence that the improvements were maintained at 5- and 14-week follow-ups; although the generalisability of the later results were cautioned due to notable attrition within the control group. The authors reported a variable pattern of change. That is, some participants gained more benefits from the program than others, with this also reflected in improvements not occurring uniformly across all measures. The authors reported that Operation Flinders was "acting as a catalyst for change on a number of characteristics deemed to be predictive of criminal offending and/or indicative of behavioural maladjustment in class" (p. 161). They concluded that there are "grounds for optimism about the effectiveness of the program in achieving its aims".

Although Mohr et al. (2001) designed their evaluation using a criminogenic framework, no attempt was made to isolate the potential moderating effects of static risk or participant/program factors. In response, Raymond (2003) replicated Mohr et al.'s (2001) evaluation methodology and outcome measures; however, he explored the relationship between participant risk (e.g., number of prior suspensions, frequency of truanting) and responsivity-based factors (including age, gender, degree program was experienced as challenging by participants) on program outcomes. Raymond found that young people who were at the highest risk of educational disengagement (as assessed by a history of pre-program school suspensions and truanting) achieved the largest program effect sizes. However, owing to the smaller sample size and the lack of control group in this analysis, the causal nature of this relationship was not able to be assessed. In summary, Raymond (2003) concluded the following:

Apart from these isolated results, the differential improvements in favour of the Operation Flinders participants were not particularly large, nor were they consistent across measures or participants.

However, overall, the size and direction of these improvements are consistent with a number of meta-analytic reviews. (p. 70)

In summary of the 2001 and 2003 evaluations, Raymond (2004) concluded:

Both sets of researchers found that young people who attended the Operation Flinders program gained benefits in self-esteem, anger [reduction], criminal cognitions and behaviour (Mohr et al., 2001; Raymond, 2003). Although the size of these improvements were not consistent across studies, the largest and most consistent improvements were found in improved classroom functioning. A disparity between studies concerned the duration (or robustness) of participant improvements. Mohr et al. (2001) found empirical support that participant improvements were maintained at 14-week follow-ups. Meanwhile, Raymond (2003), in comparing his results with Mohr et al. (2001), concluded that improvements obtained by Operation Flinders participants show some slight regression over time. (p. 5)

In 2011, Pointon (2011) conducted a pretest-posttest control group design evaluation of Operation Flinders participants. Conducted as part of a Psychology Honours program, the exploratory study examined the constructs of self-forgiveness, value affirmation, self-affirmation and responsiveness to change (Pointon, 2011). Pointon found that the process of self-forgiveness was an important mediator of participant outcomes. Furthermore, she reported that participants attending the program (compared to controls) had differential improvements in their willingness to make positive changes.

The previous quantitative studies have been supplemented with qualitative evaluations of individual intensive wilderness programs delivered by Operation Flinders for specific cohorts, including young people with an intellectual disability (Rankine, 2006; Raymond & Knuckey, 2006) and Northern Territory young people with higher levels of Indigenous representation and offending risk, compared to the South Australian program (Raymond & Lappin, 2015, 2016). Collectively, these evaluations provide qualitative

evidence that the Operation Flinders program is associated with immediate post-camp improvements in attitudes, self-concept and behaviour (Rankine, 2006; Raymond & Knuckey, 2006; Raymond & Lappin, 2015, 2016). Evidence of attitudinal and behavioural regression in the post-camp period has also been reported (Raymond & Lappin, 2015, 2016).

3.5.5 Operation Flinders Summary

Operation Flinders is an intensive wilderness program designed for young people at risk of offending, educational disengagement and poor wellbeing. While, until recently, it lacked a clearly defined program logic, its foundational program components have been delivered in a relatively consistent manner for over 20 years. Historical evaluations have found that young people exhibiting risk factors related to future offending or educational disengagement are most likely to benefit from the program (Mohr et al., 2001; Raymond, 2003, 2014). Given its stability and evaluation history, Operation Flinders is a suitably positioned intervention to assess the “catalytic” properties of intensive wilderness programs.

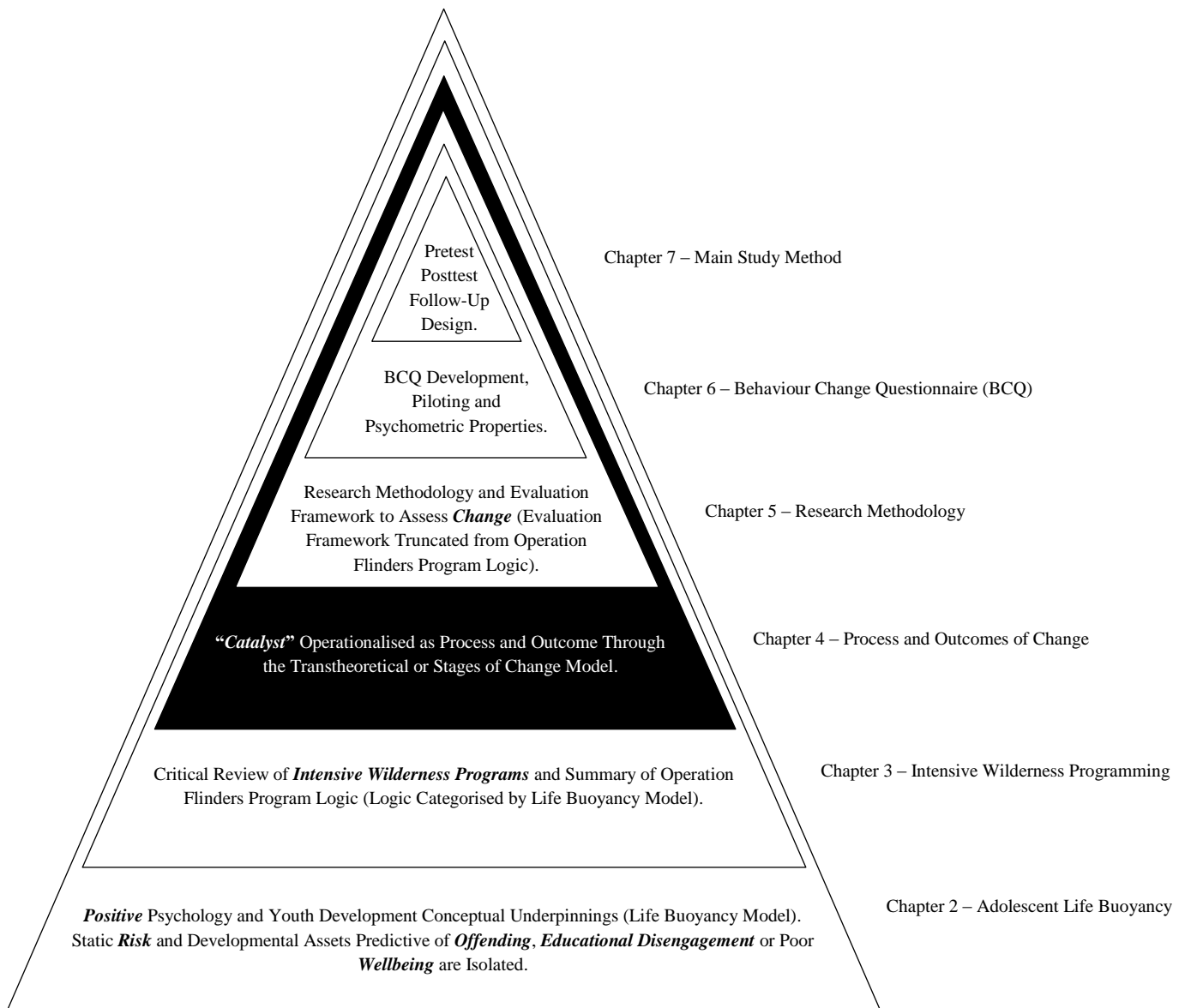
3.6 Chapter Summary

This chapter indicates that there is wide variability between intensive wilderness programs in terms of their composition, target cohort, inclusion of therapeutic enhancement strategies and outcomes delivered. The “catalyst for change” descriptor, as articulated by program developers and researchers, is consistent with the evidence that while many wilderness-adventure programs are effective in eliciting small to medium outcomes, questions regarding outcome sustainability (e.g., regression to pretest levels of functioning) exist within the literature. In other words, consistent with the catalyst descriptor, programs may elicit but not consolidate change. Given these catalytic effects have not been systematically operationalised nor assessed within the discipline, this research makes a unique and important contribution to the wilderness-adventure literature.

Chapter 4

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
Chapter 9 – Discussion
Chapter 10 - Conclusions



4 Process and Outcome of Change

This chapter defines and operationalises the descriptor “catalyst for change” as representing both a process and an outcome of change. The Transtheoretical Model (TM; Prochaska et al., 1992) is identified as a suitable model to operationalise these constructs. This chapter describes and critically reviews the TM, and its application and psychometric use across offending, educational and wellbeing contexts. Important considerations for the operationalisation of the TM within tool development are identified, and these are drawn upon in Chapter 6.

4.1 Catalyst for Change Operationalised as a Process and Outcome

Prior to operationalising the descriptor “catalyst for change”, both the terms “catalyst” and “change” warrant individual definition. The Collins Concise Dictionary (1998) defines the terms as follows:

“Catalyst” - noun – 1. A substance that increases the rate of a chemical reaction without itself suffering any permanent chemical change. 2. A person or thing that causes a change.

“Change” – verb – 1. To make or become different; alter.

Collectively, these definitions indicate that the “catalyst for change” descriptor can be defined as: (1) a change (or something has been altered) has occurred, and an action has triggered or caused this change and (2) the probability that change (or that something may be altered) might occur has increased, and an action has triggered or caused this change in probability. In short, this definition suggests that the “catalyst for change” descriptor describes both an actual change (outcome), and the process (including actions and triggers) of supporting or increasing the probability of future change. In short, “change” from this point forward is defined as both a process and an outcome.

4.2 Behaviour Change Models Operationalising Process and Outcome

As detailed in Chapter 2, this research brings a restricted focus to proximal factors (developmental assets) that are conceptually and empirically associated with reduced offending, educational engagement and enhanced wellbeing outcomes in young people. There are a number of behaviour change models that operationalise the processes and outcomes of change by focusing on proximal factors. This includes models that bring a content focus to cognitive intentions and beliefs (The Theory of Planned Behaviour, Ajzen, 1991), internal and external sources of motivation (Self-Determination Theory, Deci & Ryan, 2000), goals and feedback loops (Self-Regulation Theory, Carver & Scheier, 2012), goals and motivation (Goal Theory, Covington, 2000), self-efficacy (Bandura, 1977; Bandura, 1997b) and intentional actions (Brandstätter, Lengfelder, & Gollwitzer, 2001). Collectively, all of these models focus on the role of human agency (Bandura, 2001, 2002), or the application of forethought, motivation, cognition, self-regulation and self-awareness to elicit intentional change.

The constructs of intentionality and motivation, as applied to behaviour change, have attracted significant research interest (e.g., Covington, 2000; Deci & Ryan, 2008; Prochaska et al., 1992). Historically, individuals engaged in a behaviour change process were described in global terms such as “motivated” or “unmotivated” (Beckman, 1980). In the early 1980’s, Prochaska, DiClemente and colleagues developed a five-stage model describing the “when” and “how” people change (Prochaska & DiClemente, 1982, 1986). This model was operationalised through an assessment tool with a four factor structure (McConaughy, Prochaska, & Velicer, 1983). Following extensive application of the model across a diverse range of health behaviours, the model stabilised around 5 stages and 10 change processes in the early 1990’s (Prochaska et al., 1992), and is now widely referred to as the Transtheoretical Model (TM), stages of change, or motivation to change model. The model

continues to be operationalised and strongly endorsed by its original developers (e.g., DiClemente, 2015; Norcross, Krebs, & Prochaska, 2011; Prochaska, Norcross, & DiClemente, 2013).

The TM remains one of the most influential models of behavioural change in the areas of addiction (Povey, Conner, Sparks, James, & Shepherd, 1999), clinical and counselling settings (Petrocelli, 2002), and offending (Day et al., 2006; Polaschek, Anstiss, & Wilson, 2010). As shall be highlighted in this chapter, it has had wide application across multiple wellbeing contexts, but apart from isolated examples (e.g., Evers, Prochaska, Van Marter, Johnson, & Prochaska, 2007; Mitchell, Booker, & Strain, 2011), it has had limited exposure across school or educational contexts.

4.3 Transtheoretical Model (TM) Summarised

The TM operationalises a stage-based model of change which is used to match an intervention to an individual's readiness to change (Prochaska et al., 1992). The model acknowledges that change can occur both spontaneously (e.g., DiClemente & Prochaska, 1982) or supported through a program or intervention. At its broadest level, the model is comprised of five stages and 10 change processes. The stage component captures *when* people change, while the processes detail *how* people change (Norcross et al., 2011). They are considered in turn.

4.3.1 Five Temporal Stages

The foundational organising structure of the TM is five temporal stages: (1) pre-contemplation, (2) contemplation, (3) preparation, (4) action and (5) maintenance. They “represent a temporal dimension that allows us to understand when particular shifts in attitudes, intentions and behaviours occur” (Prochaska et al., 1992, p. 1107). In other words, the presence of increased awareness, attitudes and actions aligned to intentional future

change. The five stages are summarised from Prochaska et al. (1992, pp. 1103-1104) as follows:

- “*Pre-contemplation* is the stage where there is no intention to change behaviour in the foreseeable future.” It is characterised by a lack of awareness of problems (problem awareness) and a generalised resistance to “recognising or modifying a problem”.
- “*Contemplation* is the stage in which people are aware that a problem exists and are seriously thinking about overcoming it but have not yet made a commitment to take action.” Individuals demonstrate higher levels of problem awareness, but remain in a state of ambivalence in terms of future action.
- *Preparation* is a stage that is characterised by a decision and intent to make changes, with this manifesting in small initial behavioural changes or mental steps or intent to action change. The factor structure for this stage did not emerge within the early tool development process (McConnaughy et al., 1983), but following further analysis, it was reintroduced and remains a stable stage of the final model (Prochaska et al., 1992). However, as seen in a later section of this chapter (Table 4.1), a number of instruments founded on the TM do not include this stage.
- “*Action* is the stage in which individuals modify their behaviour, experiences or environment in order to overcome problems”. It is characterised by the presence of overt behaviours supported by actions committed through time and energy.
- “*Maintenance* is the stage in which people work to prevent relapse and consolidate the gains attained during action”. It represents a consolidation or continuation of the change process.

A strength of the TM is that these five stages can be easily operationalised and communicated across applied and research settings, with the model described as an “everyman” theory (Prochaska & Velicer, 1996) and offering high levels of heuristic value (Littell & Girvin, 2002). For example, it was applied to qualitatively describe the utility of three intensive wilderness programs for youth-at-risk (Raymond & Lappin, 2011). It has also been operationalised as a program theory for the development of an intensive wilderness intervention (Raymond & Lappin, 2015). The model can be represented graphically (frequently as a spiral or circle) or through applied examples, as represented by Figure 4.1¹².

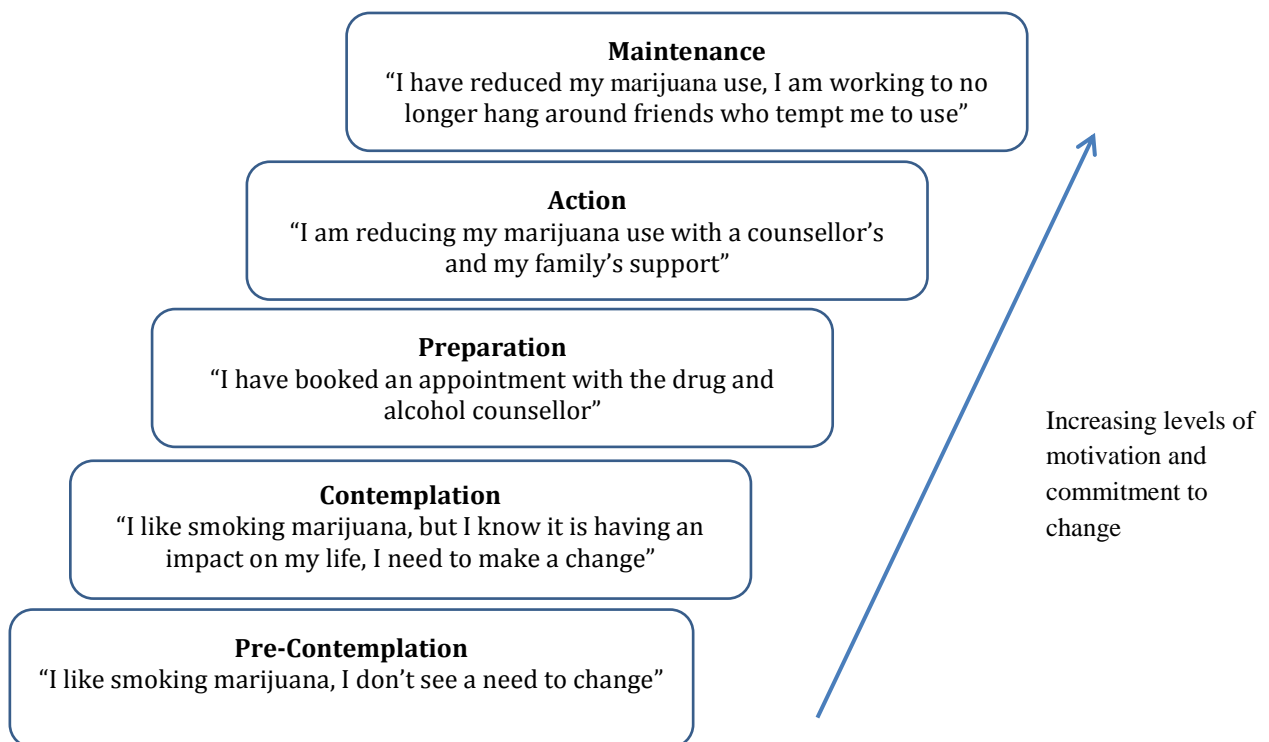


Figure 4.1 Transtheoretical Model operationalised through marijuana use

While Figure 4.1 is presented as a linear model, the way people explore and commit to change is dynamic, and linear progression is rarely noted (Prochaska et al., 1992), with minimal evidence that clients sequentially transition between stages (Littell & Girvin, 2002).

¹² Figure 4.1 is reproduced from Raymond and Lappin (2015, p. 13).

Prochaska et al. reported that if practitioners focused on a client's linear progress against the stages, they are "likely to gather disappointing and discouraging results" (p. 1112).

The strongest criticisms of the TM relate to conceptual flaws, specifically in terms of the delineation of change within discrete stages (see Bandura, 1997a; Bucksch, Finne, & Kolip, 2008; Hemphill & Howell, 2000; Littell & Girvin, 2002; Sutton, 2001). This is well summarised by Littell and Girvin (2002), and the authors suggest that readiness or motivation to change should be assessed as a continuous construct. In rebuking this collective criticism, Velicer and Prochaska (2008) uphold the importance of the "temporal dimension" of the stages, and that change occurs in a subtle and evolving way along the continuum through many growth steps.

4.3.2 Ten Processes

The TM articulates ten processes which describe how these shifts occur along the stages. Two key variables, titled decisional balance (pros and cons of behavioural change) and self-efficacy (situational confidence), are identified in the model as providing a mediating effect (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994). The ten processes were developed from a principal components of "400 plus ostensibly different psychotherapies" Norcross et al. (2011, p. 144). They include five experiential processes (consciousness raising, dramatic relief, environmental re-evaluation, social liberation, and self-reevaluation), and five behavioural processes (stimulus control, helping relationships, counter-conditioning, reinforcement management and self-liberation) (Prochaska et al., 1992). The developers argue that each process of change is differentially effective for individual stages of change, and they offer a recommended stage-matching schedule (see Prochaska et al., 1992). To illustrate, Prochaska et al. noted that behavioural processes (e.g., stimulus control, counter-conditioning), while effective in action phases, are contraindicated

(or possibly harmful) for individuals presenting in the pre-contemplation or contemplation phases.

There has been significant research and applied interest in stage-matching for health, wellbeing and addiction-related problems. While a recent meta-analysis by Norcross et al. (2011) supported the effectiveness of stage-matching on psychotherapy outcomes, this finding has not been universally replicated within the literature (Guo, Aveyard, Fielding, & Sutton, 2009). There is, however, a wide recognition that different types of communication and strategies are required for individuals at different levels or readiness for change. Specific therapeutic interventions, called motivational interviewing (Miller & Rollnick, 2013) or motivational enhancement (see Tevyaw & Monti, 2004), have emerged from this viewpoint. To operationalise the ten processes in “every person (sic)” language, Norcross et al. (2011) suggested that the therapeutic approach of the practitioner should move from *nurturing parent*, to *socratic teacher*, to *experienced coach* to *consultant*, corresponding to a client’s progression from pre-contemplation to action stages. This approach suggests that “responsibility and capability for change lies within the client and needs to be evoked (rather than created or installed)” (Slesnick, Bartle-Haring, et al., 2009, p. 682).

4.4 Transtheoretical Model (TM) Applications

While the TM has been operationalised across a wide range of behaviours and practice settings, there are significant inconsistencies in terms of how this has occurred (Adams & White, 2003; Hutchison, Breckon, & Johnston, 2008; Littell & Girvin, 2002; Spencer, Adams, Malone, Roy, & Yost, 2006; Spencer, Pagell, Hallion, & Adams, 2002). In a review of 24 different physical activity interventions based upon the TM, Hutchison et al. (2008) indicated that all components of the model were only applied in 29% of cases. Based upon this low implementation fidelity, the authors concluded that “it is not possible to draw accurate conclusions regarding the efficacy of TTM-based [Transtheoretical Model]

interventions” (p. 840). Noting this context, the following section reviews the model’s application across offending, educational and wellbeing settings.

4.4.1 Offending Applications

Youth with offending and at-risk behavioural patterns frequently present with poor motivation to change (McMurrin et al., 1998), and this remains a significant barrier to intervention effectiveness (Day, 2005; Day, Howells, Casey, Ward, & Birgden, 2007). Targeting engagement and motivation remains a key focus of treatment management (Day, 2005), and it falls under the forensic psychology construct of responsivity (see Chapter 2) (Andrews & Bonta, 2010a). The TM is the only change model that has been widely applied across offender contexts (Day et al., 2006), and a key strength of the model is that it “encourages practitioners to work with offenders to increase their motivation to change rather than labelling them as resistant or untreatable” (Casey et al., 2005, p. 167). A recent meta-analysis, including 13 published studies and 6 dissertations, provided preliminary support for the use of motivational interviewing interventions for offender cohorts (McMurrin, 2009). This provides preliminary support for the matching of therapeutic communication and an individual’s readiness for change across offender settings.

Compared to adults, there is less evidence of the TM being operationalised across young offenders. Discussion and applications within the literature include: (1) best-practice offender management (Casey et al., 2007; Day et al., 2006), (2) the design and implementation of a group-based program for adolescent sexual abusers (O’Reilly, Morrison, Sheerin, & Carr, 2001), and (3) the assessment of motivation to change of incarcerated youth, specific to offending (Hemphill & Howell, 2000), marijuana (Slavet et al., 2006) and alcohol (Clair et al., 2011).

Australian researchers have extended the application of the TM to develop an offender management construct titled “treatment readiness”. Specifically, Day et al. (2006)

have suggested that rehabilitation programmes for reducing recidivism need to consider the “process of change” or the readiness of offenders to undertake interventions. Readiness is defined as offenders engaging with “the program content, facilitators and other group members” (Day et al., 2007, p. 23). A recent literature review identified a range of individual offender, program and context factors that are conceptually related to treatment readiness (see Ward, Day, Howells, & Birgden, 2004). Day et al. (2006) suggested that offender management programs consider pre-intervention programs and activities to build treatment readiness. Such programs have been shown to deliver positive outcomes for youth with substance abuse problems (Becan, Knight, Crawley, Joe, & Flynn, 2015). To take this step further, there is a strong argument that within offending contexts, intensive wilderness programs may represent a treatment readiness program to support more explicit and action orientated interventions (e.g., cognitive behavioural therapy). In other words, the intensive wilderness program becomes the “catalyst” for explicit and action orientated behavioural strategies. This research seeks to test the utility of this proposition.

Across the psychotherapy literature, while pre-intervention readiness to change has been associated with stronger treatment effects (Norcross et al., 2011), the generalisability of this result to offending cohorts is less clear. Examining young offenders in incarceration, Slavet et al. (2006) applied the Marijuana Ladder (see Table 4.1), a tool operationalising the TM and found that higher pre-intervention scores were predictive of stronger treatment engagement and substance reduction outcomes. In contrast, in two Australia studies examining adult offender populations, pre-intervention readiness to change was not associated with outcomes related to drug use (Gossop, Stewart, & Marsden, 2007) and anger management (Williamson, Day, Howells, Bubner, & Jauncey, 2003). In a related study, Heseltine, Howells, and Day (2010) found that while readiness to change was not associated

with behaviourally focused treatment outcomes, it was related to the increased acquisition of anger related knowledge following the delivery of an anger management intervention.

In summary, while the TM offers utility for offender contexts (Casey et al., 2007; Day et al., 2006; Polaschek et al., 2010), it requires a nuanced and critical lens to its application. This is explained as follows. First, while the process of change is an important consideration to explain offender management (Serin & Lloyd, 2009) and treatment readiness (Casey, Day, & Howells, 2005), alone it is not a sufficient model to explain crime prevention or desistance (Serin & Lloyd, 2009). Second, the construct of problem awareness is an important intervention target, or criminogenic need, within offender interventions (Day et al., 2006). Third, there is a need for larger scale validation studies assessing readiness to change for different cohorts of offenders and offence groups (Day et al., 2007), and this would appear particularly relevant to youth offenders given the paucity of research in this area. This research brings attention to this latter area by assessing motivational constructs for young people with risk factors related to future offending.

4.4.2 Educational Applications

Across the educational literature, there are very few applied or research articles that have operationalised the TM for problematic behaviours occurring in high school settings. In two examples, the model was used to evaluate the effectiveness of a school-based stress prevention program (Vierhaus, Maass, Fridrici, & Lohaus, 2010) and an anti-bullying intervention (Evers et al., 2007). In both studies, motivation to change was applied as an outcome variable, with motivation found to increase across the intervention period. In the study most relevant to this research, Mitchell et al. (2011) developed the Readiness to Respond to Intervention Scale (RRIS), which was adapted from the URICA (see subsequent section, Table 4.1). This tool was tested and validated in a “disciplinary alternative educational placement” which included young people with disruptive and at-risk behaviour

and segregated from mainstream classes. While the RRIS exhibited an internally consistent factor structure aligned to the TM, construct validity was not assessed. In summary the applied and research utility of the TM across educational settings, particularly for youth presenting with challenging behaviours (e.g., aggression, conduct behaviours and violence), remains largely unknown. Through the development, piloting and validation of the Behaviour Change Questionnaire (detailed in Chapter 6), this research brings attention to this underdeveloped research area.

4.4.3 Wellbeing Applications

The TM has been extensively applied to behaviours conceptually related to wellbeing, including smoking cessation (Cahill et al., 2010), condom use in high-risk males (Grimley, 1993), adolescent mental health settings (Greenstein, Franklin, & McGuffin, 1999), adolescents with anorexic symptoms (Rieger & Touyz, 2006), physical activity in youth (Walton et al., 1999), adolescent diabetes management (Kaugars, Kichler, & Alemzadeh, 2011), HIV prevention (Prochaska et al., 1994), child and adolescent obesity (Cobb, 2011) and adolescent substance abuse (Russell, 2008). The model was initially developed for behaviours impacting on health and wellbeing, including smoking (DiClemente & Prochaska, 1982), psychiatric symptoms (McConaughy et al., 1983) and addictions (Prochaska et al., 1992). The TM remains highly influential within addiction treatment management (DiClemente, Schlundt, & Gemmel, 2004).

Evidence for the utility of the model across health and wellbeing settings remains mixed. In a recent Cochrane review, stage-based interventions for smoking were found to be more effective than non-staged based interventions (Cahill et al., 2010). However, this result was inconsistent with a previous review (Spencer et al., 2002). In another Cochrane review, motivational interviewing was not found to be more effective than other psychotherapeutic strategies for drug and alcohol management (Smedslund et al., 2011). In terms of physical

activity outcomes, reviews have found support for (Spencer et al., 2006) and against (Bridle et al., 2005) the effectiveness of staged versus non-staged interventions. A reported strength of the model is its ability to predict treatment outcomes. In a recent meta-analysis, Norcross et al. (2011) found that pre-treatment stages of change (e.g., stages associated with increased awareness, attitudes and actions aligned to intentional future change) were moderately positively correlated with future psychotherapy outcomes ($d = .46$), thus supporting the predictive validity of the model.

4.5 Instruments Operationalising Transtheoretical Model

The psychometric and conceptual properties of instruments assessing the TM have attracted significant criticism (Littell & Girvin, 2002; Sutton, 2001; Weinstein, Rothman, & Sutton, 1998). A number of meta-analyses have raised the need for consistent operationalisation, standardisation and internal consistency of measures (Bridle et al., 2005; Marshall & Biddle, 2001; Spencer et al., 2006). This has been evidenced by low correlations or concordance between different measures assessing change stages, and incompatible stage names and definitions (Sutton, 2001; Sutton, 1996).

Littell and Girvin (2002) argued that “stage classification results in a substantial loss of information” (p. 248), and contrary to the position of the model developers (Prochaska & Velicer, 1996), they argued for a continuous measure of readiness to change that was operationalised as increased levels of problem awareness, intentions and behavioural adaptations. They suggested that “readiness to change” is likely to increase from the pre-contemplation to the middle stages (preparation and action), and then reduce at the maintenance stage. This continuous conceptualisation has been strongly advocated by Sutton (1996, 2001) and others (Bandura, 1997a), and has been also referred to as the “intention to change” (Sutton, 1996, p. 203). The operationalisation and assessment of motivation through a continuous construct remains underdeveloped (Littell & Girdin, 2002).

Table 4.1 summarises a selection of widely applied instruments operationalising the TM across offending, education and wellbeing contexts. The following section reviews instrument variation in respect to three aspects: (1) assessment construction and format, (2) self- versus observer-completion and (3) applied versus research applications. Each is considered in turn.

Table 4.1

Instruments Operationalising or Conceptually Aligned to Transtheoretical Model

Instrument	Design and Uses	References
University of Rhode Island Change Assessment (URICA or SOCS)	The URICA is a 32-item self-report rating format (5-point Likert) assessing the constructs of pre-contemplation, contemplation, action and maintenance for identified problems.	(McConaughy, DiClemente, Prochaska, & Velicer, 1989)
Readiness to Respond to Intervention (RRIS)	The RRIS is a 23-item self-report rating format (3-point Likert) assessing the pre-contemplation, contemplation, action and maintenance for at-risk students with self-identified behavioural problems. Adapted from URICA.	(Mitchell et al., 2011)
Readiness to Change Questionnaire (RCQ)	The RCQ is a 12-item self-report rating format (5-point Likert scale) assessing the constructs of pre-contemplation, contemplation and action for alcohol related problems.	(Heather & Rollnick, 1993; Rollnick, Heather, Gold, & Hall, 1992)
Readiness to Change Questionnaire – Clinical Version (RCQ-CV)	The RCQ-CV is 16-item observer-report rating format (5-point Likert scale) assessing the constructs of pre-contemplation, contemplation, action and maintenance for alcohol related problems. Adapted from RCQ.	(Hodgins, 2001)
Anger Readiness to Change (ARCQ)	The ARCQ is a 12-item self-report rating format (5-point Likert scale) assessing the constructs of pre-contemplation, contemplation and action for convicted adult prisoners with anger problems. Adapted from RCQ.	(Williamson et al., 2003)
Readiness to Change Offending Questionnaire (RCOQ)	The RCOQ is a 12-item self-report rating format (5-point Likert scale) assessing the constructs of pre-contemplation, contemplation and action for offending problems (adults in a psychiatric hospital). Adapted from RCQ.	(McMurran et al., 1998)
Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ)	The ANSOCQ is a 20-item checklist of anorexic related symptoms, with five statements assessing the constructs of pre-contemplation, contemplation, preparation, action and maintenance.	(Rieger & Touyz, 2006; Rieger et al., 2000)
The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)	The SOCRATES is a 20-item self-report rating format (5-point Likert scale) assessing the constructs of pre-contemplation, contemplation, preparation, action and maintenance. Three factor solution used: recognition ambivalence, and taking steps.	(Miller & Tonigan, 1996)
The Contemplation Ladder	Visual analog of an 11-step ladder with labels matched to pre-contemplation, contemplation, preparation and action stages of smoking cessation. This tool has also been operationalised for marijuana (Marijuana Ladder; Slavet et al., 2006) and alcohol for incarcerated youth (Alcohol Ladder; Clair et al., 2011).	(Biener & Abrams, 1991)

4.5.1 Assessment Construction and Format

Instruments operationalising the TM have been constructed in three ways: staging algorithms, rating formats, and visual analogs. For a detailed review of staging algorithms and rating formats the reader is encouraged to read Sutton (2001). Each is considered in turn.

4.5.1.1 Staging Algorithm

The staging algorithm is the most commonly applied assessment process (Littell & Girvin, 2002). The respondent reviews a series of *yes* versus *no* questions that assess their intention to consider and engage in future behaviour change. Responses categorise respondents to specific stages of the TM. There are numerous examples of staging algorithms within the literature (e.g., Bucksch et al., 2008; Crittenden, Manfredi, Warnecke, Cho, & Parsons, 1998; DiClemente et al., 1991; Grimley, 1993; Kaugars et al., 2011; Rieger et al., 2000; Walton et al., 1999). Given this heterogeneity, examples are not provided in Table 4.1. The strength of the staging algorithm is the ease of administration, and that respondents can be allocated to discrete stages efficiently. The criticisms center on the validity of operationalising motivation to change as discrete stages (Littell & Girvin, 2002), and evidence of low concordance between different measures assessing change stages (Sutton, 2001; Sutton, 1996).

4.5.1.2 Rating format

Tools applying the rating format assess stages through multiple questionnaire items, and scores are derived for each dimension (with continuous motivation to change scores computed in some cases). The University of Rhode Island Change Assessment (URICA; McConaughy et al., 1989), the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonigan, 1996) and Readiness to Change Questionnaire (RCQ) (RCQ; Heather & Rollnick, 1993; Rollnick et al., 1992) are the most commonly cited tools in the literature. As detailed in Table 4.1, a number of these tools have been adapted to specific

behaviours and settings (e.g., behaviourally disordered students in alternative educational settings; Mitchell et al., 2011). The psychometric properties of rating scales are routinely questioned (Littell & Girvin, 2002), in terms of construct validity (e.g., Abellanas & McLellan, 1993) and stage independence (e.g., Hemphill & Howell, 2000).

4.5.1.3 Visual Analogs

The visual analog is a single-behaviour assessment tool where statements aligned to an intention or stage of change, as categorised by the TM, are overlaid upon an image (e.g., ladder). Respondents circle the image or statement corresponding to their intent or willingness to engage in change behaviours. The most widely validated tool is the Contemplation Ladder (Biener & Abrams, 1991), which has also been operationalised for youth offender cohorts through the Marijuana Ladder (Slavet et al., 2006) and Alcohol Ladder (Clair et al., 2011). Visual analogs are brief and efficient tools, with preliminary evidence suggesting supporting their concurrent validity with longer rating format questionnaires (e.g., URICA; Amodei & Lamb, 2004).

4.5.1.4 Self- Versus Observer-Completion

As reported in Table 4.1, self-report measures have been extensively applied to assess motivation to change. There are examples of observer-report assessment of motivation completed by clinicians and parents (Cobb, 2011; Hodgins, 2001). Hodgins found evidence of concurrent validity between clinician- (RCQ-CV) and self-report versions of the Readiness to Change Questionnaire. However, in a related study, Cobb found a lack of concordance between parent- and self-report assessments of motivation to change in a clinical sample of obese youth.

4.5.1.5 *Applied and Research Applications*

Measures operationalising the TM have been used across both research and practice settings. For example, the SOCRATES (see Table 4.1) was developed for both research and clinical purposes (Miller & Tonigan, 1996). Miller and Tonigan reported that they provided SOCRATES scores to their clients to initiate a discussion on motivation to change, and this therapeutic process was operationalised through a treatment manual (Miller, Zweben, DiClemente, & Rychtarik, 1992). In terms of research applications, Miller and Tonigan note that “changes in SOCRATES scores could reflect the impact of an intervention on problem recognition, ambivalence, and taking steps toward change. Baseline values may also be predictive of compliance with change efforts” (p. 366). In both respects, motivational measures have been widely applied to assess program impact through pretest posttest assessment (e.g., McHugh, 2007; McMurrin et al., 1998; Russell, 2008; Tucker et al., 2015), or assess pre-intervention motivation as a moderator of future program or behavioural outcomes (e.g., Bettmann et al., 2013; McHugh, 2007; Tucker et al., 2015). While there is a strong positive association between pre-intervention motivation and intervention outcomes (see meta-analysis by Norcross et al., 2011), this finding is not reported universally across the literature (e.g., Gossop et al., 2007; Woodall, Delaney, Kunitz, Westerberg, & Zhao, 2007). Weinstein et al. (1998) suggested that the most frequent methods to assess stage models were correlational designs that compared cross sections of individuals in different stages.

4.5.1.6 *Predictor Variables*

A number of studies have examined the predictors of motivation to change. This section reviews predictor variables most relevant to this research. Representing a process variable within the TM (Prochaska et al., 1992), self-efficacy is one of the most widely assessed predictor variables (DiClemente, 2015). Higher levels of self-efficacy, as operationalised to specific behaviours at the focus of the change process, is correlated with

increased levels of motivation to change for adolescents with anorexia (Rieger, Touyz, & Beumont, 2002), youth with poor diabetes management compliance (Kaugars et al., 2011) and physical health activity (Berry, Naylor, & Wharf-Higgins, 2005; Bucksch et al., 2008). While global or generalised measures of self-efficacy have not traditionally been applied as predictor variables, in a study of adult offenders, higher levels of global self-efficacy was positively associated with the action stage of change (McMurrin et al., 1998).

Problem severity, as operationalised through higher levels of stress, and emotional or behavioural symptoms, has been associated with increased levels of motivation to change. For example, motivation to change has been found to be positively correlated with depressive or anxiety symptoms (Cobb, 2011; Slesnick, Bartle-Haring, et al., 2009), severity of substance use and more negative family environments (Slesnick, Bartle-Haring, et al., 2009), and young people exhibiting more severe health related anorexic symptoms (McHugh, 2007).

As proposed and investigated in the self-determination literature theory (Deci & Ryan, 2000; Ryan & Deci, 2000a), motivation to change can be differentially moderated by extrinsic versus intrinsic factors (Ryan & Deci, 2000a). To illustrate, internal factors specific to an individual's construction of self, their identified lifestyle and personal desires (e.g., wanting to get off drugs), is a stronger predictor of motivation to change than external factors or stressors (e.g., court and financial pressures related to drug use) (Fickenscher, Novins, & Beals, 2006; Kennedy & Gregoire, 2009).

4.6 Critical Review and Summary

This chapter has found that the TM is one of the most influential models of behavioural change across both offending and wellbeing settings. However, it is not without its detractors. The following section critically reviews the TM and identifies key summary themes that are visited again in Chapters 6 and 9. Across the literature there is evidence of irreconcilable viewpoints that centre on the following themes:

- The role and value of stage-matching interventions. On one hand, there is a view that “staged matched interventions seem premature and ill-advised” (Littell & Girvin, 2002, p. 255), while on the other, they are regarded as an evidence-based intervention (Prochaska & Velicer, 1996; Velicer & Prochaska, 2008).
- The conceptualisation of behavioural change through continuous (Bandura, 1977; Bandura, 1997b; Littell & Girvin, 2002) versus discrete or temporal dimensions (Prochaska & Velicer, 1996; Velicer & Prochaska, 2008).

In contrast, there is more consistent agreement that the TM:

- Offers both intuitive and heuristic value, particularly within applied settings (Littell & Girvin, 2002), where it has brought important attention to working “with” an individual to “evoke” motivation to change (Miller & Rollnick, 2013, p. 24), and at the same time, “discourage the tendency to view low levels of motivation or compliance as pathological” (Day et al., 2007, p. 22).
- Has brought focus to key processes of behavioural change. Specifically, as per the model’s design (Prochaska et al., 1992), the constructs of problem awareness (Casey et al., 2005), cognitive intentions and behavioural adaptations (Littell & Girvin, 2002). These constructs appear to offer utility across offending, education and wellbeing settings.
- Is inconsistently operationalised and assessed across the literature, and there is a need to bring stronger psychometric rigour and standardisation to instrument development and implementation (Bridle et al., 2005; Marshall & Biddle, 2001; Spencer et al., 2006).
- Is implemented with low fidelity, as per the original design (Prochaska et al., 1992), across multiple applied settings (Hutchison et al., 2008).

- Requires further operationalisation and empirical validation to assess its utility for children and adolescents (Geller, 2006) and across educational settings (Mitchell et al., 2011). There is an argument that the “model should be used cautiously with adolescents...given the limited amount of evidence” (Spencer et al., 2006, p. 438).

4.7 Tool Development Considerations

In Chapter 6, the Behaviour Change Questionnaire (BCQ) operationalises motivational constructs that are included as dependent variables in the main study (Chapter 7). As previously noted, current tools assessing motivation to change have attracted significant criticism (Littell & Girvin, 2002; Sutton, 2001; Weinstein et al., 1998). A review of the literature finds little guidance in terms of how to operationalise motivational constructs to behavioural problems that have a strong interpersonal component (e.g., offending), or occur outside health and wellbeing contexts (e.g., within schools). For this reason, the following section isolates three summary themes that were brought to the tool development process in Chapter 6. These are: (1) clear operational and behavioural definitions, (2) motivation as a continuous construct and (3) problem awareness to cognitive attention to behavioural activation. These themes were formulated with heavy consideration to the forensic psychology literature, where there has been significant recent interest in operationalising readiness to change for different offending behaviour and contexts (see Casey et al., 2005; Day et al., 2006; Serin & Lloyd, 2009). The themes are considered in turn.

4.7.1 Clear Operational and Behavioural Definitions

Based upon the author’s review of Sutton (2001), Casey et al. (2005), Day et al. (2006) and Serin and Lloyd (2009), it is concluded that the operationalisation and assessment of motivation to change, specific to externalising behaviours (e.g., aggression, conduct or avoidant behavioural patterns), needs to consider the following factors:

- *Behavioural Frequency* - Casey et al. (2005) suggested that the TM (and associated tools) were developed, tested and validated with high frequency behaviours (e.g., smoking, alcohol use). There is an emerging viewpoint that the model is weaker for lower frequency behaviour, for instance offending (Casey et al., 2005; Sutton, 2001).
- *Intrapersonal Versus Interpersonal Impact* - Many health behaviours (smoking, drinking, weight gain) have a high intrapersonal impact on the individual concerned (e.g., the individual experiences personal health issues). It has been suggested that the model is weaker for behaviours that have a higher interpersonal impact (e.g., aggressive actions impacting on others) (Casey et al., 2005).
- *Problem Comorbidity* – Assessment instruments appear to demonstrate poorer psychometric properties when comorbid problems are present, for instance, substance use and anger (Miller & Tonigan, 1996), or poly substance use (Abellanas & McLellan, 1993). Motivation to change has been found to vary as a function of different drugs, with the assessment of behaviour and motivation confounded in one study (Gossop et al., 2007).
- *Behaviour and Symptom Sub-Factors* – Across offending contexts, there is significant heterogeneity across offence groupings, for instance, aggression versus white collar crime. The application of the TM across different offence groupings remains uncertain (Casey et al., 2015). A motivation scale designed to assess a young person's willingness to address their anorexic symptoms found that motivation to change varied as function of different symptom clusters (Rieger & Touyz, 2006).

- *Problem and its Context* - McMurrin et al. (1998) modified the RCQ to assess offending problems in a psychiatric facility. The scale was found to demonstrate poor internal consistency and was contraindicated for use. McMurrin et al. suggested that this was due to the term “offending” being too general and occurring too infrequently. However, in a detailed review of this study, Casey et al. (2005) explain the results in terms of sampling, and a confounding between assessed problem (offending) and the sample context (psychiatric patients).

Based upon their review, Casey et al. (2005) indicated that the TM was a weaker model for behaviours that are infrequent, interpersonal in nature and not clearly identified. For the purpose of this research, the author concludes that any tool measuring motivation to change *should assess clearly identifiable behavioural problems that are operationalised specific to the respondent and their context.*

4.7.2 Motivation as a Continuous Construct

A strong criticism of the TM is delineation of change through discrete stages (see Bandura, 1997a; Bucksch et al., 2008; Hemphill & Howell, 2000; Littell & Girvin, 2002; Sutton, 2001). Consistent with the strong argument provided by Littell and Girvin (2002), this research adopts the view that a continuous measurement of motivation to change offers significant utility. This viewpoint reflects the recent operationalisation of the TM in offending contexts where motivation to change and treatment readiness were constructed as a continuous measure (Casey et al., 2007; Williamson et al., 2003). It also reflects contemporary assessment measures bringing greater attention to continuous assessment (e.g., ANSOCQ; McHugh, 2007), and existing measurement tools (e.g., URICA) being frequently scored and applied as a continuous measure (e.g., Bettmann et al., 2013).

4.7.3 Problem Awareness to Cognitive Intention to Behavioural Activation

If a continuous measurement of motivation to change is to be developed, there is a need to detail how increasing levels of motivation will be operationalised (Littell & Girvin, 2002). This research operationalises increasing levels of motivation to change through the following four constructs, with low to high motivation to change represented on a continuum corresponding to points 1 to 4 respectively.

1. No problem awareness or recognition.
2. Problem awareness and recognition (problem awareness).
3. A cognitive or thought driven intention to change (cognitive intention).
4. Activation of a behaviour aligned to a change process (behavioural activation).

These constructs are congruent with the TM (Prochaska et al., 1992), and uphold the importance of human agency (Bandura, 2001, 2002), or the role of forethought, motivation, cognition, self-regulation and self-awareness to elicit intentional change. They also reflect the widespread acknowledgement of problem awareness or problem recognition (Miller & Tonigan, 1996) within the assessment and management of multiple health and conduct related behaviours. For example, problem awareness has been isolated as an important point of intervention across offending (Casey et al., 2005; Day et al., 2006), adolescent substance abuse (Becan et al., 2015) and youth mental health and wellbeing contexts (French, Reardon, & Smith, 2003).

The role of cognitive intentions has also been identified within other behavioural models (e.g., The Theory of Planned Behaviour; Ajzen, 1991), and they remain a widely recognised and accepted feature of the behaviour change process (Littell & Girvin, 2002; Prochaska et al., 1992). The construct of behavioural activation reflects the importance of actions or behavioural adaptation being a culminating point of the change process (Littell &

Girvin, 2002; Prochaska et al., 1992), and the role of behaviours in delivering change outcomes (Cuijpers, Van Straten, & Warmerdam, 2007).

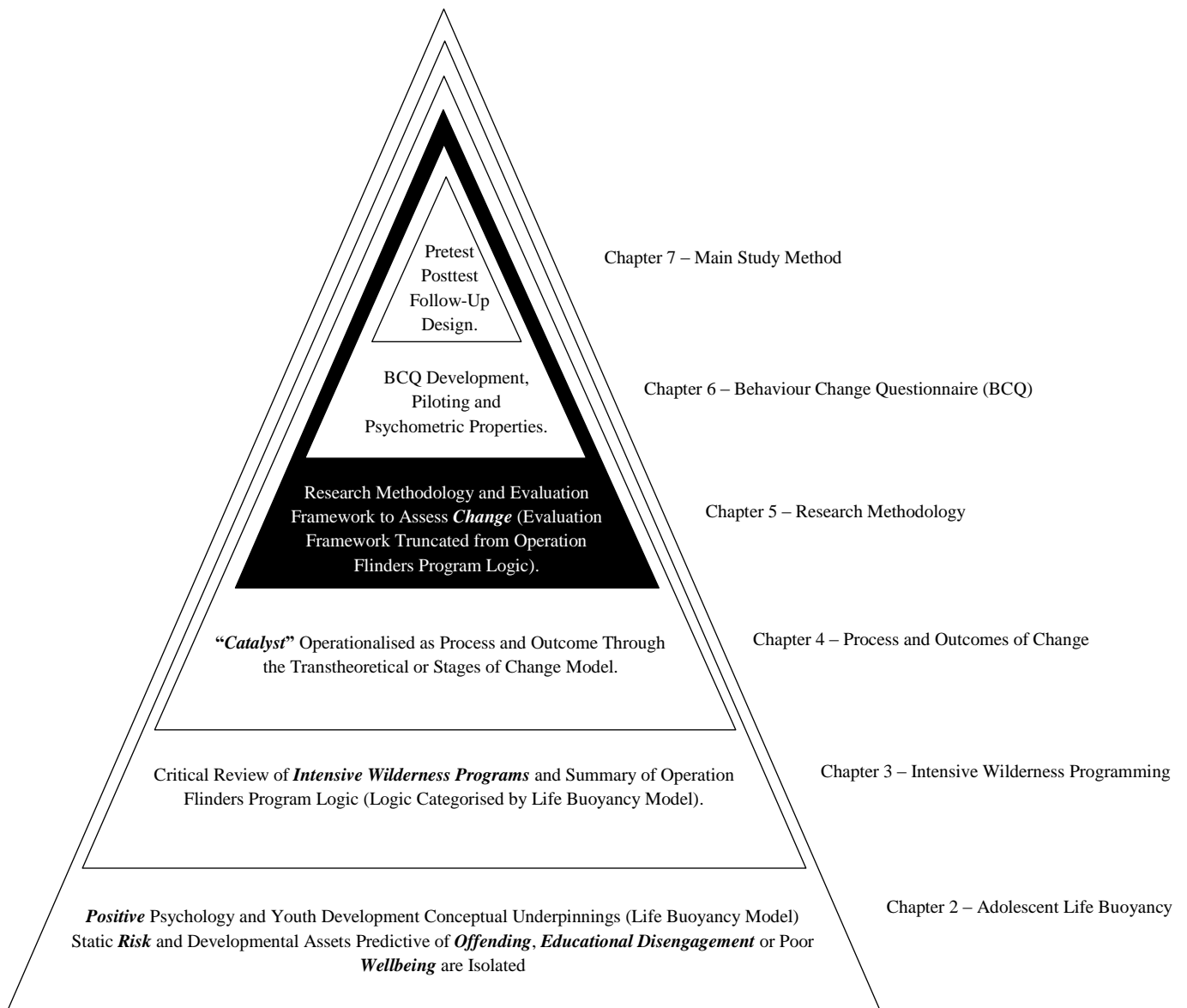
4.8 Chapter Summary

This chapter has operationalised the “catalyst for change” descriptor through the TM (Prochaska et al., 1992), and critically reviewed the model’s application across offending, educational and wellbeing settings. While the model has not been operationalised across mainstream educational settings for students presenting with behaviours indicative of educational disengagement (e.g., conduct behaviours, aggression, avoidance), key features of the model appear to offer significant utility for this context; specifically: problem awareness, cognitive intentions and behavioural activation. The design, piloting and validation of the Behaviour Change Questionnaire, as reported in Chapter 6, has occurred in line with points raised in Sections 4.6 (Critical Review and Summary) and 4.7 (Tool Development Considerations) of this chapter.

Chapter 5

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
Chapter 9 – Discussion
Chapter 10 - Conclusions



5 Methodological Framework

This chapter summarises the best-practice considerations relating to the measurement of “change”. A summary of the participant and agency-based factors that constrained the implementation of these criteria across the research is detailed. The design and implementation considerations for the pilot, main and follow-up studies is provided in this chapter, with detailed procedural methodology articulated in Chapter 6 (pilot study) and Chapter 7 (main and follow-up study).

5.1 Measurement of Change

This section provides a detailed review of the best-practice considerations for the measurement of change, specific to internal and external validity, the randomised control trial and statistical power. In the following section, the constraints impacting on the implementation of these considerations is provided, and Section 5.3 summarises the final research design that is reflective of both the best-practice considerations and applied implementation constraints.

The research sought to assess the effectiveness of an intensive wilderness program for young people at risk of offending, educational disengagement and poor wellbeing. The measurement of change has attracted significant interest across behavioural and evaluation scientists (Lipsey & Cordray, 2000; Ployhart & Vandenberg, 2010; Rogosa, Brandt, & Zimowski, 1982), and remains a key driver in the development of evidence-based government policy (Head, 2008). While change has been frequently assessed by measuring a construct or dependent variable at two points in time, there has been increasing calls for measurement to occur across three or more time points (Singer & Willett, 2003). On this basis, the broad research question could, in the first instance, be reframed as the following hypothesis:

Young people who attend the Operation Flinders program show improvements across pretest, posttest and follow-up measurements related to motivation to change, offending, educational engagement and wellbeing.

Several factors confound the inferences that can be drawn from repeated measures hypotheses of this type. The assessment of internal validity is essential to ensure that misleading results are not produced (Campbell & Stanley, 1963; Ioannidis et al., 2014). Brewer (2000) suggested that an evaluation has high internal validity when a causal (and non-confounded) relationship occurs between an independent and dependent variable. The author argued this is satisfied when the following three conditions are met: (1) the "cause" precedes the "effect" in time (temporal precedence), (2) the "cause" and the "effect" are linked (covariation), and (3) there are no plausible alternative explanations for the relationship between the variables (no spurious relationship). In terms of the current research, there are possible confounds or "threats" that have the potential to impact on the meeting of these three conditions. They are discussed in the following section.

5.1.1 Threats to Internal Validity

There are a number of threats to internal validity relating to repeated testing evaluations. This occurs when there is a plausible explanation for how the effects on the dependent variable were produced by a third factor (Brewer, 2000). While it is beyond the scope of this chapter to systematically detail all possible threats to internal validity underpinning change research (for detailed summary see: Brewer, 2000; Campbell & Stanley, 1963; McMillan, 2007), the following key threats are identified as possible risks in the current research. First, events occurring outside of the research or between the repeated measures may influence participant responses (history). Participant-based factors may change spontaneously during the study or between repeated measures in a manner that is influenced by factors external to the study (maturation). Measurement biases may occur when

participants are tested on one or more occasions, for example, as participant capacity to answer questionnaire items changes or historical conditioning to respond in a certain manner external to the intervention occurs (testing effects). A further threat to internal validity occurs when participants enter an intervention at a point of extreme functioning (e.g., they have recently become suspended from school), and through the intervention period they naturally, and unrelated to the study, regress back to the mean. In the current research, this was identified as key threat to manage, given young people were likely to come to the attention of referral personnel at an elevated state of behaviour problems. Repeated testing research designs may also be impacted by attrition, where participants do not complete the follow-up measures, manifesting in sampling error or biases. Finally, a further threat to internal validity is poorly calibrated and imprecise measurement tools, or tools that are implemented in an inconsistent manner (Pepper, Petrie, & Sullivan, 2010).

5.1.2 Threats to External Validity

Another important consideration for evaluators is external validity. This refers to the degree that the results of a study can be generalised to other situations, people or interventions (Campbell & Stanley, 1963). A threat to external validity is an explanation of how a generalisation of an evaluation may be wrong, and it centres on the confounders of people, places or times. For instance, in the current research, the generalisability of the results is restricted to the nature and profile of the participants drawn into the study, the specific composition of the intervention (brief intensive wilderness program), and the time and context of the intervention (e.g., evaluation conducted in 2013 within an Australian sociocultural context). As discussed in Chapter 3, the Operation Flinders program, at the time of research, lacked an established program logic (and theory) and operational guidelines to consistently describe the program's outcomes, processes and components. Unrelated to this research, and explained in Chapter 3, during the research period (2014), the author developed

a program logic for the Operation Flinders program (specific to the delivery of a related intervention for Northern Territory participants). This program logic was not formally endorsed or implemented by the Operation Flinders Foundation in 2013. Therefore, the lack of descriptive operationalisation of the Operation Flinders program at the time of data collection did not support strong program integrity or fidelity (Goldkamp, 2010; Lipsey, 2009; Tucker & Rheingold, 2010). In addition to poor fidelity or integrity being contraindicated within best-practice program implementation (see Section 2.4: Asset Building Programs and Best-Practice Features), it remains a significant threat to a study's internal and external validity (Fixsen et al., 2009; Mowbray, Holter, Teague, & Bybee, 2003; Royse et al., 2010). The monitoring of program fidelity remains an important consideration of evaluation science (Mowbray et al., 2003), and a recommended evaluation benchmark for wilderness-adventure researchers (Norton et al., 2014; Tucker & Rheingold, 2010). However, owing to the lack of program logic and theory (supported by operational guidelines) for the Operation Flinders intervention, the conditions required for such monitoring were not present at the time of data collection (Lösel, 2007).

In experimental research there is a trade-off between internal and external validity (Campbell & Stanley, 1963; Godwin et al., 2003). For instance, there is an argument that field research, or research embedded in real-life settings (as opposed to laboratories), strengthens external validity. However, this often occurs at the cost of increasing the number of possible confounders. Conversely, laboratory based experiments limit threats to internal validity, but their generalisability to real-life people or situations is often reduced (Rothwell, 2005; Taxman & Rhodes, 2010). While Campbell and Stanley (1963) advocated that strongest researcher attention is brought to internal validity, the prioritisation of external validity is increasingly being stressed within both the evaluation (Chen, 2010) and policy literature (Hedges, 2013; Steckler & McLeroy, 2008).

External validity can be strengthened in a number of ways (Campbell & Stanley, 1963). First, representative sampling of the population or intervention cohort supports the generalisation of findings. Second, stratifying the sample on the basis of different participant profiles or risk groups provides the opportunity to increase external validity of the results for stratified cohorts (Tipton, 2013). Finally, accurately delineating the nature and composition of the intervention provides the opportunity to generalise the results to like interventions (Lösel, 2007). All three factors are considered in this research. That is, detailed demographic data was systematically captured, a population sampling method was employed, and the Operation Flinders program were operationalised by the author as a brief and intensive wilderness program (see Chapter 3).

5.1.3 Randomised Control Trial (RCT)

A widely applied evaluation process that addresses many of the aforementioned threats to internal validity is the randomised control trial (RCT; Gugiu & Gugiu, 2010; Lösel, 2007). This involves both participants and control group members being randomly assigned (with no exceptions) to intervention and control conditions, and the participants only receiving the intervention. Both sets of participants are assessed prior to the intervention (pretest) and then following the intervention (posttest), with additional follow-up measurements recommended (Singer & Willett, 2003). The net effect is that both groups are not distinguished by any common factor apart from the experimental treatment. RCT has been described as the “gold standard” for evaluation research (Gugiu & Gugiu, 2010; Lösel, 2007), and remains an evidence benchmark for both international (e.g., Higgins & Green, 2009) and Australian (e.g., Glasziou, Irwig, Bain, & Colditz, 1999) biomedical research. Despite this, there are significant differences in the quality of RCTs (Moher, Schulz, & Altman, 2001), and there are strong questions regarding the utility and feasibility of implementing RCTs within highly applied settings (Scriven, 2008), including the evaluation

of complex forensic interventions (Hollin, 2008) and wilderness-adventure program research (Gabrielsen et al., 2015). There is also a range of ethical constraints that impact on the randomisation process (Emanuel, Wendler, & Grady, 2000). Overall, the external validity or generalisability of RCT findings to real life settings is routinely questioned within the literature (Rothwell, 2005).

5.1.4 Statistical Power

An important consideration for evaluators assessing change across groups is statistical power (Britt & Weisburd, 2010; Ioannidis et al., 2014; Lipsey, 1990; Oakes & Feldman, 2001). Statistical power represents the likelihood that a research design will detect a change when there is a change there to be detected. The probability of making a Type II error, or concluding there is no change when, in fact, there is a change, is reduced when a study has sufficiently high statistical power (Cohen, 1992). Power is increased through increased sample size and by reducing measurement errors in predictor and outcome variables (Lipsey, 1990; Oakes & Feldman, 2001). In research planning, Cohen suggests that researchers should consider both the hypothesised effect size and the alpha significance criterion (e.g., $\alpha = .05$), and identify the group sample size required to reduce the probability of making a Type II error. Effect size refers to the magnitude of the expected change, and applying Cohen's conventions, can be denoted as small, medium and large. In the research design, the alpha significance was set at .05 and a medium effect size ($d = 0.5$) was sought. Applying Cohen's (1992) conventions, a minimum of 64 cases were required in both the treatment and comparison groups.

5.2 Constraints on Research Design and Implementation

This section summarises the applied research constraints that impacted on the implementation of the considerations identified in section 5.1. There is a number of significant challenges that arise in applied research, notably in the context of child and

adolescent cohorts (for a detailed summary see: McCall & Groark, 2010). The design and implementation of the research was constrained by a range of intervention, participant and agency related factors, summarised below.

5.2.1 Restricted Number of Intensive Wilderness Program Interventions

As noted in Chapter 3, wilderness programs are notably heterogeneous. This research restricted itself to the evaluation of established intensive wilderness programs for young people at risk of offending, educational disengagement or poor wellbeing. This, combined with the need to recruit a sufficiently large participant sample to assess medium sized outcome effects, provided significant restrictions on the interventions that could be considered as part of the research. An online and journal review found no complete and consolidated database of Australian delivered wilderness programs. The researcher engaged with local experts, including the South Australian representative of the Australian Association for Bush Adventure Therapy Incorporated, which “is the peak body for practitioners who have a professional interest in supporting, developing and promoting the field of Bush Adventure Therapy”¹³. Collectively, the correspondence indicated that there were very few established programs within Australia that met the research parameters. It was identified that the Operation Flinders program was an intervention positioned to answer the research question.

The researcher has had a long-term professional association with the Operation Flinders program, including in the roles of program facilitator (1999 to 2005) and program evaluator and consultant (2003 to 2011). Furthermore, given the researcher’s deep knowledge of the program’s referral processes, an opportunity was identified to dovetail the research methodology into established referral systems, and thereby maximise stakeholder and participant engagement. Given the evaluation was restricted to the Operation Flinders

¹³ <https://www.aabat.org.au/about/constitution>

program, the research was constrained by the participant and agency related factors specific to this program. These are considered in turn.

5.2.2 Participant Factors

The selection of participants attending the Operation Flinders program occurs through schools or youth agencies that nominate and support groups to undertake the program at the start of the calendar year. At the time of the research, the selection criteria for the Operation Flinders program were young men and women, aged between 13 and 17 years, who were “identified as being at risk”. Risk is operationalised individually by referral agencies, and in the scoping process, Operation Flinders leadership indicated that this was likely to include issues related to offending, family and social problems, educational disengagement and low self-worth or confidence. Exclusion criteria for the program included severe mental health presentation (including suicidal ideation, psychosis), physical illness and injury. Given the lack of clear program inclusion criteria, the research design had to consider a heterogeneous participant sample (as identified in previous evaluations: Mohr et al., 2001; Raymond, 2003) with the following contextual and individual features.

5.2.2.1 School-Based Referral Pathways

In the scoping phase, Operation Flinders leadership reported that the majority of 2013 referral groups originated from South Australian government schools, including learning and behavioural support centres for young people who were not able to cope with or be educated within mainstream educational settings. In short, the research design (e.g., selection of outcome measures) and implementation (e.g., completion of questionnaires within schools) had to be integrated within educational or school contexts.

5.2.2.2 Mobile, Geographically Dispersed and Disengaged Participant Cohorts

Through the research planning process, it was identified that a high proportion of participants were likely to have sporadic and unreliable school attendance patterns. Discussion with staff from the referral agencies indicated that young people's level of school or agency engagement was mediated by a range of factors in their lives, including their mental or physical health, family situation and social or external needs. It was also reported that many young people presented with high levels of mobility related to school, friendship group and community. The researcher reviewed historical records relating to program referrals in 2011 and 2012. The review revealed that program referrals had been received from schools and youth agencies across South Australia, the Northern Territory and Victoria; with approximately 50% of referrals originating from remote or regional locations, ranging from 50km to 3000km from the metropolitan hub of Adelaide. In summary, the research design and implementation had to be cognisant of the mobile, geographically dispersed and disengaged participant group.

5.2.2.3 Developmental Factors

During the planning phase it was foreshadowed that the participant cohort may present with developmental needs or impairments that would impact on the completion of the assessment measures. For example, young people with offending backgrounds are likely to present with impairments in a range of domains, including: reading, writing and numeracy ability (Putniņš, 1999; Rucklidge et al., 2013); oral language ability (Snow & Powell, 2012; Stattin & Klackenber-Larsson, 1993); and verbal and non-verbal reasoning (Flouri & Tzavidis, 2011). Furthermore, attention related problems remain strongly positively correlated with behavioural problems and delinquency (Moffitt, 1990), lowered school completion rates (Breslau, Miller, Joanie Chung, & Schweitzer, 2011), self-harming and suicidal tendencies (Hawton, Saunders, & O'Connor, 2012) and poorer satisfaction with life

(Nadeau et al., 2014). Finally, young people with at-risk tendencies are likely to present with mistrust or suspicion towards authority figures (Gormally & Deuchar, 2012). In summary, the research design had to be cognisant of participant attention, literacy and personality-based (e.g., suspicion, mistrust) factors.

5.2.3 Restrictions on Randomisation

A central feature of the RCT is the randomisation of participants to treatment and control conditions (Moher et al., 2001). The conditions for randomisation did not exist with the Operation Flinders program for the following reason. Operation Flinders leadership reported that the intervention places groups of young people under high levels of physical and psychological stress, where maladaptive and challenging coping responses are regularly elicited. Referral agencies are responsible for selecting young people for the intervention, with a central selection consideration being group cohesiveness and functioning. There is a body of literature that indicates that group-based programs for young people have the potential to be psychologically or therapeutically harmful (Dishion, McCord, & Poulin, 1999; McCord, 2003). For instance, adolescent development is strongly influenced by peer contagion (Dishion & Tipsord, 2011), and the aggregation of young people to group interventions may translate to positive or negative contagion outcomes (Arnold & Hughes, 1999). Deviancy training is a social learning process frequently elicited in forensically-orientated group programs where young people with conduct problems train and condition other young people in deviant behavioural patterns (Mager, Milich, Harris, & Howard, 2005). Given the importance of reducing program harm through negative peer contagion (and for group cohesiveness to be a central driver of participant selection) randomisation was not ethically nor pragmatically supported in the current research. Restrictions on randomisation frequently occur in criminological evaluations that assess interventions applying therapeutic

communities (Lösel, 2007). The lack of randomisation was identified as a foundational threat to the internal validity of the research.

During the planning phase, the author identified that the conditions required to recruit non-randomised control group members were present. Previous evaluations had supported the viability of this research method (Mohr et al., 2001; Raymond, 2003). Consideration was given for participants to be a wait list control, nominated to receive the Operation Flinders intervention after the treatment group. Through scoping discussions with school and agency representatives, the author identified that individual referral agencies only had access to the Operation Flinders program on a yearly basis (and this was not guaranteed to occur). Furthermore, school representatives indicated that they were not in a position to identify participants 12 months ahead of time for a future program, and even if this was present, they reported that notifying participants and their families of an intervention that was not guaranteed to occur had the potential to be harmful for vulnerable young people. For the reasons noted, the use of a wait-list control was not pragmatically nor ethically supported in the current research.

5.2.4 Funder Needs

At the time of the research, Operation Flinders was funded by the South Australian Attorney General's Department (AGD) as a crime prevention strategy. Operation Flinders leadership requested that the research respond to the AGD's funding requirement that an evaluation was undertaken during the funding period. The researcher sought clarification from the AGD regarding their expectations of the evaluation, and from correspondence provided, an important term of reference to be captured in the research was to:

Assess the effectiveness of Operation Flinders to reduce the re-offending risk (or recidivism) of young people attending its program.

Therefore, the research design had to be cognisant of this funder need. To this effect, a feasibility review of assessing longitudinal recidivism through crime and police data was undertaken. As comprehensively reviewed by Richards (2011), recidivism is a difficult measure to operationalise and assess, in particular for juvenile cohorts where the patterns of offending are unique and have different developmental trajectories compared to adults. Recidivism can be assessed in the following ways: (1) self-reported data, (2) police contact and/or apprehension data, (3) court appearance and conviction data and (4) correctional services data (Payne, 2007). Each of these data sources has strengths and limitations, and there are distinct periods of monitoring required for each data source (for detailed review see Payne, 2007).

Initially a retrospective review of recidivism was considered. This is when archival data is reviewed retrospectively. The researcher reviewed the conditions required to identify a suitably matched retrospective control group. Given the ethical protocols in place, and extreme difficulty previous researchers had in accessing archival and departmental data related to Operation Flinders and matched participants (Mohr et al., 2001), it was decided that the conditions were not present for a methodologically sound retrospective analysis of recidivism. In their 2001 evaluation of the Operation Flinders program, Mohr et al. (2001) came to the same conclusion:

The conditions necessary to permit retrospective identification of an appropriate comparison group were not found to exist for either organisation [referring to government agencies relating to education and youth justice]. (p. 64)

A prospective longitudinal analysis of recidivism, applying behavioural orientated crime statistic measures, was also considered. This involves tracking participants and matched comparison participants for a period of 12 months post-program in a prospective manner. Richards (2011) argues that prospective rather than retrospective tracking of recidivism should be considered within evaluation design. Given both the reporting

requirements of the PhD and funding body (AGD), the conditions were not present for this to occur. Instead, it was proposed that the research would lay the foundation in terms of identifying matched control participants and establishing ethical protocols for a subsequent retrospective study of recidivism.

5.2.5 Program Development

During the research planning, Operation Flinders leadership requested that the research support the development and refinement of a program logic and theory, with a focus on understanding participants' experience of the program, and the moderators (e.g., goal setting, participant behaviour) of program outcomes. Given this, and that the inclusion of process variables remains an important consideration for wilderness program evaluation (Russell, 2000; Russell & Phillips-Miller, 2002), a number of process related variables were integrated within the main study. The measures and results of these variables (e.g., participant behaviour during Operation Flinders program) are only reported when they have been applied to assess construct validity of outcome measures applied within the main study.

5.3 Research Design

This section details the broad research design, and how it reflects both best-practice considerations (section 5.1) and applied implementation constraints (5.2). In other words, the research was designed to minimise threats to internal and external validity, but in a manner that was cognisant of the restrictions and expectations imposed by the participant group, referring agencies and the Operation Flinders program. The design was benchmarked against the RCT methodology, with randomisation not pragmatically nor ethically feasible. Characteristic of field based research (Eisner, Malti, & Ribeaud, 2011; Lösel, 2007), there was a need to balance methodological rigour with the demands imposed by the implementation restrictions. The design included the following features:

- Pretest posttest follow-up design.

- Operationalisation, development and validation of the Behaviour Change Questionnaire (Youth- and Teacher-Report).
- Reliable, validated, sensitive and brief outcome measures.
- Assessment and stratification of the participant cohort.
- Population sampling.
- Youth- and teacher-report measures.
- Six- to eight-week post-testing.
- Inclusion of within program process variables.

These features are detailed in the following sections.

5.3.1 Pretest Posttest Follow-Up Design

The research utilised a pretest posttest control group design (quasi-experimental) with the inclusion of a 12-month follow-up of educational behavioural outcomes. This design was mapped against the randomised pretest posttest follow-up design (RPPF) (Mara et al., 2012; Rausch, Maxwell, & Kelley, 2003), and provided the opportunity to assess longitudinal program impact. The design reflects current viewpoints that program evaluators apply three or more measurement points (Singer & Willett, 2003) The selection of a comparison group, drawn from the same population, enabled the measurement of change, while at the same time controlling for the repeat-testing effects of maturation, history, and regression towards the mean. This design is based upon the premise that the control group remains identical to the treatment group, apart from the latter undergoing the intervention (attending Operation Flinders). However, given random assignment was not ethically feasible, the design was quasi-experimental in nature, with confounds related to participant sampling remaining a threat to the evaluation's internal validity (Campbell & Stanley, 1963). Detailed methodology related to the selection and recruitment of the control group is provided in Chapter 7,

including statistical processes undertaken (propensity score matching) to manage confounds related to sampling bias (based upon recommendations by Stuart & Rubin, 2008).

5.3.2 Operationalisation, Development and Validation of Behaviour Change Questionnaire (Youth- and Teacher-Report)

A central objective of this research was the evaluation of an intensive wilderness program within the theoretical and applied context of the Transtheoretical Model (TM; Prochaska et al., 1992). Chapter 4 provides a detailed overview of the TM and associated assessment instruments (Table 4.1). Section 4.7 of Chapter 4, Tool Development Considerations, indicates that assessment tools operationalising the model should “assess clearly identifiable behavioural problems specific to the respondent and their context”. In the current research, it was identified that young people were likely to present with behavioural problems related to offending, educational disengagement and poor wellbeing. However, an important context to consider was the Operation Flinders’ primary point of referral (mainstream educational settings). Given that educational disengagement is conceptually and empirically related to wellbeing and offending outcomes in young people (see Chapter 2, Section 2.3.1), behavioural problems indicative of educational disengagement were identified as an important focal point of assessment. As summarised in Chapter 4, it became apparent that there were no validated instruments, based upon the TM, that assessed the multi-dimensional nature of educational disengagement, or could be integrated within a mainstream school setting. Therefore, a specific instrument would need to be created. In short, an important outcome of this research was the operationalisation, development and validation of an instrument to measure motivation to change for youth presenting with behavioural problems, indicative of educational disengagement, within mainstream school settings. Chapter 6 reports on this task and the development and validation of the Behaviour Change Questionnaire (Youth- and Teacher-Report).

5.3.3 Reliable, Validated, Sensitive and Positive Psychology Outcome Measures

The research sought to include a wide range of measures conceptually related to offending, educational engagement and wellbeing, but framed in congruence with the positive psychology literature. For instance, Tables 2.1, 2.2 and 2.3 in Chapter 2 define and summarise these proximal outcomes as developmental assets. Across the literature, outcome measures were readily located for all three domains. However, particularly in the case of the offending literature, a number of widely applied and validated outcome measures were operationalised in terms of deficits or “needs” (e.g., Identification with Criminal Others, Aggressive Impulses). For the purpose of categorising these outcomes within the evaluation framework (Table 5.1), this research has positively reframed deficit-orientated measures (e.g., prosocial cognitions, self-control) in this table. However, within the main study (Chapter 7) and results section (Chapter 8) of this thesis, the original naming has been retained to ensure that the constructs are not misinterpreted. This point highlights the reliance on deficit or non-strength-based measures within the literature. Therefore, for positive psychology to be routinely applied across wider behavioural contexts (e.g., forensic psychology), there is a need for the discipline to operationalise and validate strength-focused measures in these contexts.

A number of pre-existing tools were assessed for use within the research. For example, across the North American Outdoor Behavioral Healthcare literature, the Youth Outcome Questionnaire (YOQ) is routinely applied as a pre- and post-program outcome measure (Gillis et al., 2016). As this measure was designed and normed for clinical populations (e.g., including psychiatric settings) (Burlingame, Wells, Lambert, & Cox, 2004), it was not assessed as appropriate for a sample with heterogeneous risk factors. Measures assessing educational engagement were also reviewed. The Student Engagement Instrument (Appleton et al., 2006) and the Motivational Engagement Scale (Liem & Martin, 2012) bring

a restricted focus to assessing engagement within mainstream school settings. They were assessed as not being sensitive for youth presenting with behaviours indicative of chronic school avoidance (e.g., drug and alcohol use, truancy). The Youth Level of Services Inventory (YSLI) was reviewed as an outcome measure tapping offending constructs (Bechtel, Lowenkamp, & Latessa, 2007). As the tool was designed for youth with current offence histories, it was assessed as not being sensitive for young people with no prior criminal history. Given the aforementioned, an assessment questionnaire that included a number of composite scale measures was developed.

All individual assessment measures were assessed for their psychometric rigour, which is associated with increased statistical power, and internal and external validity (Ioannidis et al., 2014). However, the inclusion of multiple youth-report outcomes had to consider the cognitive and attention capacity of the participants. The researcher sought to limit the youth-report questionnaire (applied in the main study) to approximately 100 items. This figure was identified with consideration to stakeholder feedback provided to the author in a previous evaluation (Raymond, 2003), and was supported by school and child development experts consulted during the research planning phase. Given the restrictions imposed on the questionnaire length, the main study included a number of brief (3 to 5 item) outcome measures. While measures with a small number of items often exhibit low internal consistency (Furr, 2011), the main study chose a trade-off between reduced psychometric rigour (on some scales) and broadening the number of outcome measures.

The research sought to identify outcome measures that were sensitive and developmentally appropriate to the youth-at-risk participant cohort, and whose psychometric properties were already known. The sensitivity of scale items and dependent measures improves internal validity and statistical power (Lipsey, 1990), meaning that smaller effect sizes can be detected and more robust conclusions on intervention effects drawn from the

study. An important consideration was that the outcome measures did not have a “floor” or “ceiling” effect, but instead, were sensitive to identify attitudinal or behavioural changes in a heterogeneous sample of young people with broad risk factors related to offending, educational disengagement and poor wellbeing. Through a wide literature search, it became evident that brief, sensitive and validated measures were not available for many dependent variables. The development of outcome measures for young people with complex needs has been identified as a research need (Lennox, 2014). In response to these limitations, in the main study, the researcher identified or developed scale measures by following a hierarchy of decision making points, as follows:

1. A brief, tested and validated instrument for a youth-at-risk cohort was sought and applied. When this was not available:
2. A brief, tested and validated instrument for a child or youth cohort was sought, and this was reviewed and modified for a youth-at-risk cohort, where required. When this was not available:
3. An instrument was designed by the researcher by reviewing its conceptual operationalisation within the literature, and the instrument was reviewed by experts.

All outcome measures were mapped against constructs in the evaluation framework (Figure 5.1). Chapter 7 provides a detailed overview of the development of each outcome measure employed within the main study, including the underlying psychometric properties (reliability and validity). In the behavioural sciences it is recommended that evidence supporting the content and construct validity of scales is provided to readers (Knapp & Mueller, 2010). Knapp and Mueller (2010) suggested that validity is supported through researchers engaging content experts to review and refine scale items. To this end, experts

provided feedback on scale and questionnaire items, and detailed reporting of construct validity is provided within this thesis.

5.3.4 Assessment and Stratification of the Participant Cohort

The research was designed to evaluate the effectiveness of the Operation Flinders wilderness program for young people at risk of (1) offending, (2) educational disengagement and (3) poor wellbeing. Therefore, there was a requirement to stratify the participant sample on the basis of risk. Chapter 2 provides a summary of static risk indices predictive of youth offending, educational disengagement and poor wellbeing. The main study included a wide range of demographic and static risk factors predictive of all three outcomes. This is summarised in the evaluation framework (Static Risk Predictors, Table 5.1). The inclusion of wide ranging risk and demographic variables is a best-practice consideration of criminological evaluation (Lösel, 2007), and quasi-experimental evaluations where sampling bias poses a threat to internal validity (Stuart & Rubin, 2008). By assessing multiple covariates, the opportunity is provided to assess the balance (or similarity) between the treatment and control groups, and thereby increase the scope to address sampling bias through statistical processes (Luellen, Shadish, & Clark, 2005; Stuart & Rubin, 2008).

5.3.5 Population Sampling

External validity is strengthened through representative sampling. A population sampling method was employed in the main study that sought the recruitment of all young people undertaking a 2013 Operation Flinders program. In the design phase, the recruitment pool was identified as approximately 400 participants, recruited from at least 60 individual referral agencies or schools. In an earlier study, Raymond (2003) found that over two thirds of Operation Flinders treatment and control group participants had a school suspension history (70 to 86%), while over one third of both groups had a criminal conviction history (34 and 39%), respectively. The research was designed that if the sample was stratified on the

basis of these static risk variables, there would be sufficient statistical power to detect medium effect sizes (Cohen, 1992).

There is a number of unique recruitment challenges in conducting large scale field research (Eisner et al., 2011), particularly studies (as in the current research) occurring over multiple sites, where significant attention has to be paid to study implementation to manage threats to internal validity (Taxman & Rhodes, 2010). Sampling biases arising from participant recruitment and retention remains a significant threat to internal and external validity (Campbell & Stanley, 1963; McKnight, McKnight, Sidani, & Figueredo, 2007). The recruitment and retention of minority groups within research studies (Yancey, Ortega, & Kumanyika, 2006), including young people with at-risk or offending profiles (Dwyer & Hayes, 2011), and adolescents more generally (Poole & Peyton, 2013), provides a number of distinct challenges to researchers. In an Australian sample, Robbins et al. (2012) found that a young person's motivation to engage in research varies by age and gender. In larger scale longitudinal research it is recommended that feasibility studies are conducted to review the practical strategies to recruit and retain participants (Yancey et al., 2006). To this end, the previous evaluations by Mohr et al. (2001) and Raymond (2003) provided invaluable knowledge to understand the participant and systemic barriers impacting on participant recruitment and retention. Consistent in the literature is that trust between the research process and participant remains a significant facilitator of recruitment (Dillman, Smyth, & Christian, 2008; Yancey et al., 2006). Dillman et al. (2008) suggest that trust is supported through the researcher providing information, validation and positive regard to participants. This is further supported by the research being linked to a "legitimate authority", for instance a university (Dillman et al., 2008), and being supported and valued by the participants' identified community (Yancey et al., 2006). In terms of the latter, an important community to be engaged by the researcher was the participants' school or referral agency. Further factors

supporting recruitment and retention include minimising inconvenience and embarrassment, designing questionnaires that are easy to read and complete, and limiting the use of subordinate language (Dillman et al., 2008). The research was designed to include both a pilot and main study, with the pilot study providing the researcher the opportunity to receive feedback from participants in terms of the factors that influenced their motivation to participate in research.

The use of incentives or payment regularly occurs in adolescent research, with this occurring at higher rates for youth-at-risk cohorts (Borzekowski, Rickert, Ipp, & Fortenberry, 2003). Incentives have been found to “produce modest increases in survey response rates” within minority group research (Yancey et al., 2006, p. 16). While they remain an important motivator supporting Australian adolescent engagement in longitudinal research studies, motivation also varies in accordance with a range of altruistic and internal factors (Robbins et al., 2012). The main study used incentives (\$15.00 voucher) to acknowledge participant time and effort on two separate occasions. This occurred in concordance with the “Australian code for the responsible conduct of research” (NHRMC, 2007), and was reviewed by two separate ethics committees.

In summary, significant time and resources were allocated to participant engagement, and the points identified in this section were integrated into the research design. In the main study, a systematic engagement strategy was designed and implemented to recruit and retain participants from geographically diverse communities, and to redress high levels of distrust, mobility and disengagement expected within the cohort. A “partnership” narrative was embedded in all formal and informal correspondence between the researcher and all key stakeholders and agencies involved in the evaluation. Partnering has been identified as a best-practice principle underpinning the design and implementation of evaluation processes (Mertens & Wilson, 2012).

5.3.6 Youth- and Teacher-Report Measures

The main study included both youth- (completed by Operation Flinders or control group participants) and teacher-report questionnaires. The latter were completed by school personnel and provided first-hand observations of young people. The inclusion of both types of measures provided an opportunity to assess attitudinal, psychological and behavioural outcomes, and to provide a source of cross-validation to mitigate the risk of response biases, which remain a threat to a study's internal validity (Paulhus, 1991). This was considered important as the measurement of sensitive constructs (e.g., offending behaviour and attitudes) is associated with increased risk of measurement errors (Pepper et al., 2010), which Pepper et al. suggested requires richer data collection and more rigorous analysis. The organisation and layout of the participant questionnaire was designed to minimise response bias through the inclusion of negatively and positively worded items (Furr, 2011; Giles, 2002).

5.3.7 Six to Eight Week Post-Testing

Across the literature, there are no prescriptive guidelines in terms of posttest completion timings (Lösel, 2007). Lösel suggests that the longer the follow-up period, the more difficult to evaluate program outcomes and to isolate the natural confounding factors originating in the community or extraneous interventions. He argued that “relatively short follow-up times are adequate, but if possible, they should be used as a starting point in a more valid assessment of outcome data over a longer period” (Lösel, 2007, p. 158). In the main study, the timing of the posttest phase was designed to correspond to the period when psychological and attitudinal outcomes were being consolidated. A six- to eight-week follow-up interval was chosen as it could be replicated across the five separate Operation Flinders programs occurring in 2013, and it was inclusive of the constraints posed by South Australian school holiday periods. Mohr et al. (2001) and Raymond (2003) had previously employed 5- and 4-week follow-ups.

5.3.8 Inclusion of Within Program Process Variables

The main study integrated a number of within program process variables assessing participant behaviour, experiences and psychological processes elicited or observed during the eight-day Operation Flinders program. The measures and results of these variables (e.g., participant behaviour during Operation Flinders program) are only reported in this research when they have been applied to assess construct validity of outcome measures applied within the main study.

5.4 Evaluation Framework

Program logic models (as described in Chapter 2 and 3) provide a theoretical framework to link together program processes and outcomes (Funnell & Rogers, 2011; Jordan, 2013). These models include program inputs, activities, outputs, short and medium term impacts, and longer term outcomes (for a detailed review of developing logic models see: McLaughlin & Jordan, 1999). Logic models assist program developers and managers to articulate their program story and performance (McLaughlin & Jordan, 1999), clarify evaluation goals or outcomes (O’Keefe & Head, 2011) and assist in program monitoring evaluation (Bamberger et al., 2012; Cooksy et al., 2001; Funnell & Rogers, 2011). Logic models offer significant utility within program design, implementation and evaluation (Funnell & Rogers, 2011; Mertens & Wilson, 2012).

At the time of research implementation (2013), the Operation Flinders program was founded upon a loosely conceptualised program model. Through unrelated program consultancy occurring across 2014 (Raymond & Lappin, 2015), a program logic model (and theory) was designed for Operation Flinders’ delivery of a Northern Territory program (Figure 3.1, Chapter 3). A truncated version of this model is provided in Table 5.1 and this represents the evaluation framework categorising the measures employed within the main study of this research. Specifically, it organises the (1) static risk and background

demographic factors (titled Static Risk Predictors), (2) short-term outcomes and (3) medium-term outcomes which are operationalised in the main study (see Chapter 7). This evaluation framework has been conceptually categorised by the Life Buoyancy Model, (see Section 2.5, Chapter 2).

Table 5.1

Evaluation Framework

Static Risk Predictors	Short-Term Outcomes (Developmental Assets)			Medium-Term Outcomes
	Awareness	Skills	Mindset (Values & Beliefs)	
Program attendance ^a	Problem awareness ^d	Positive educational risk taking ^a	Prosocial cognitions (operationalised as “identification with criminal others” in main study) ^a	School attendance ^g
Sex ^a		Self-control (operationalised as “aggressive impulses” in main study) ^a		Behavioural incidents at school ^g
Age ^a		Adaptive school and classroom behaviour (prosocial behaviour, persistence, initiation, cooperation) ^e	Positive attitudes to teachers ^a	Classroom & school problems ^{d h}
Indigenous ^a				Truancy frequency ^h
Pre-program truancy ^a			Positive attitudes to police ^a	Alcohol consumption frequency ^h
Pre-program alcohol consumption ^a			Intrinsic value orientation ^f	Offending frequency ^h
Pre-program offending ^a			Motivation to change ^d	Satisfaction with life ^h
Pre-program suspension ^a			Optimism ^a	
Pre-program criminal conviction ^a			Self-efficacy ^a	
Pre-program exclusion ^a			Self-esteem ^a	
Family support ^a			Positive aspirations for future ^c	
Socio-economic status ^a				
Single parent household ^b				
Sleep length ^a				
Rural (vs city) ^a				
Year level ^a				
Educational achievement ^e				

Note: ^aVariable applied within main study, and defined in Appendix Z (Table Z.1). ^bOperationalised and defined by variable name “living both parents”. ^cOperationalised and defined by variable name “aspire to complete year 12”. ^dAssessed through the Behaviour Change Questionnaire (Youth- and Teacher-Report). ^eAssessed through Behaviour Academic Self-Esteem (BASE) and Behaviour Change Questionnaire (BCQ) behavioural scales. ^fOperationalised and defined by variable names: “intrinsic value orientation” and “extrinsic value orientation”. ^gAssessed through electronic behavioural data, with variable names: “school suspension/exclusion (DECD)”, “school unexplained absences”, “school explained absences”, “school attendance rate”, “left school within 12 months”. ^hVariable applied within main study, and defined in Appendix Z (Table Z.1), with assessment occurring at same time as short-term outcomes.

5.5 Research Hypotheses

Through the finalisation of the research design and evaluation framework, the broad research question was operationalised into the following two hypotheses.

1. Young people undertaking the Operation Flinders program, with static risk factors predictive of future offending, educational disengagement or poor wellbeing, have higher levels of functioning on measures conceptually related to these outcomes, compared to matched young people with the same risk profile who are not exposed to the Operation Flinders program.
2. Young people undertaking the Operation Flinders intervention, with static risk factors predictive of future offending, educational disengagement or poor wellbeing, have greater motivation to make changes in behaviours indicative of educational disengagement, compared to matched young people with the same risk profile who are not exposed to the Operation Flinders intervention.

5.6 Research Phases and Three Studies

These research hypotheses were tested through three interdependent research phases comprised of (1) Behavioural Change Questionnaire (BCQ) development and refinement (operationalising and assessing motivation to change), (2) BCQ validation and program evaluation and (3) assessment of long-term behavioural outcomes. Across each of these phases, experts were engaged, and three separate studies were completed. Within this thesis they are titled pilot study, main study and follow-up study. This is summarised in Figure 5.1.

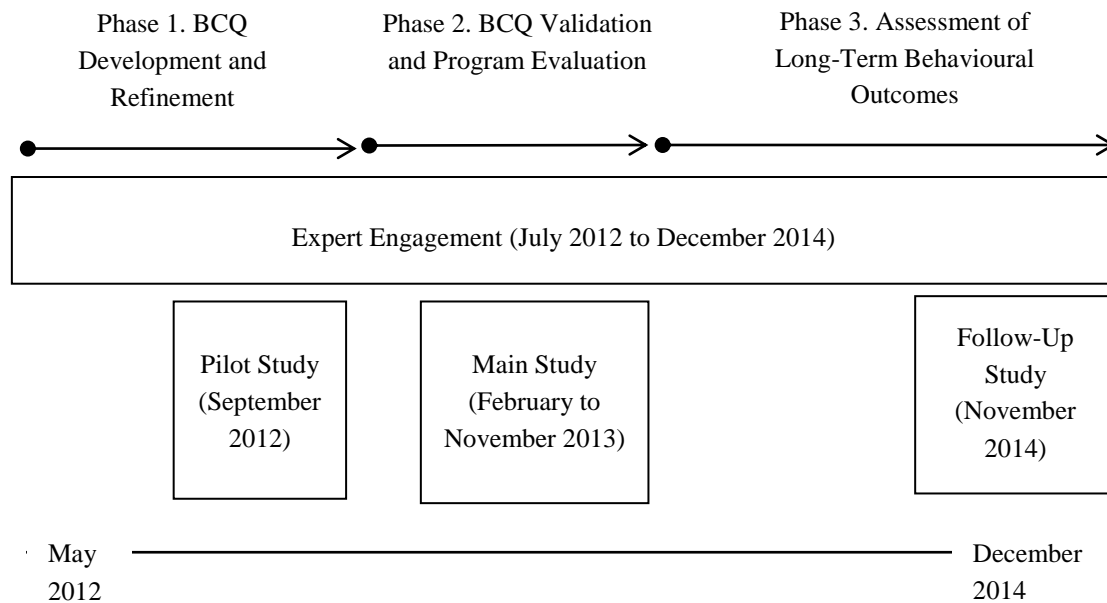


Figure 5.1 Timeline summary of research phases (arrows) and study components (blocks)

5.6.1 Phase 1: Tool Development and Refinement

The aim of this phase was to design and refine the Behaviour Change Questionnaire (Youth- and Teacher-Report). This phase included item development and refinement through expert review and through a pilot study (N = 71). The specific methodological processes related to the engagement of experts and the pilot study are detailed in Chapter 6.

5.6.2 Phase 2: Tool Validation and Program Evaluation

This aim of this phase was to validate the Behaviour Change Questionnaire (Youth- and Teacher-Report), and systematically test the research hypotheses and question. The psychometric properties of the Behaviour Change Questionnaire are detailed in Chapter 6, while the main study (or program evaluation) method is detailed in Chapter 7, with outcome results provided in Chapter 8.

5.6.3 Phase 3: Assessment of Long-Term Behavioural Outcomes

The aim of this phase was to explore longer-term behavioural patterns, related to school attendance, behaviour and retention. Data were gathered through a follow-up study, and specific methodology related to this phase is summarised in Chapter 7, with the results provided in Chapter 8.

5.7 Ethical Considerations

The research was conducted according to the National Health and Medical Research Council guidelines (NHRMC, 2007). For each of the three phases of the research, approval was granted from Flinders University Social and Behavioural Research Ethics Committee, the Department of Education and Child Development, and Operation Flinders Clinical Advisory Committee. Ethical procedures related to voluntary participation or responding, non-participation or withdrawal without prejudice, and confidentiality were followed at all times. In the main study (see method reported in Chapter 7), the researcher was supported by school teachers or local agency personnel to administer the participant pretest and posttest questionnaires. A protocol for the administration of the questionnaires was provided to all personnel to ensure that ethical procedures related to the administration and management of research data were maintained (Appendix U).

Permission was granted from each local manager or school principal to conduct both the pilot (see Appendix B) and main study (see Appendix G). Information sheets were provided and informed consent was obtained for all participants involved in the research. For the purpose of ethical approval, “participants” in the pilot study were as follows:

- Young people – guardian (see Appendix C) and participant (see Appendix D) information sheets and consent forms.
- Experts – information sheet and consent form (see Appendix A).

As part of the ethical processes, “participants” in the main study were as follows:

- Young people – guardian (see Appendix I and K) and participant (see Appendix J and L) information sheets and consent forms.
- Agency counsellors and teachers – information sheet and consent form (see Appendix N).
- Key liaison personnel (agency personnel who disseminated and supported the administration and management of questionnaires) – information sheet and consent forms (see Appendix H).
- Program facilitators – information and consent form (see Appendix M).

5.8 Independence

The researcher had previous contracted and formal organisational roles with the Operation Flinders Foundation from 1999 to 2011. To uphold independence, the researcher resigned from all formal roles with Operation Flinders in 2011, and this was maintained throughout the research period. For the financial years 2012 to 2014, the Operation Flinders Foundation provided a \$12,000.00 grant (per year) to cover incidental research expenses, including participant incentive vouchers, travel costs, stationery and postage.

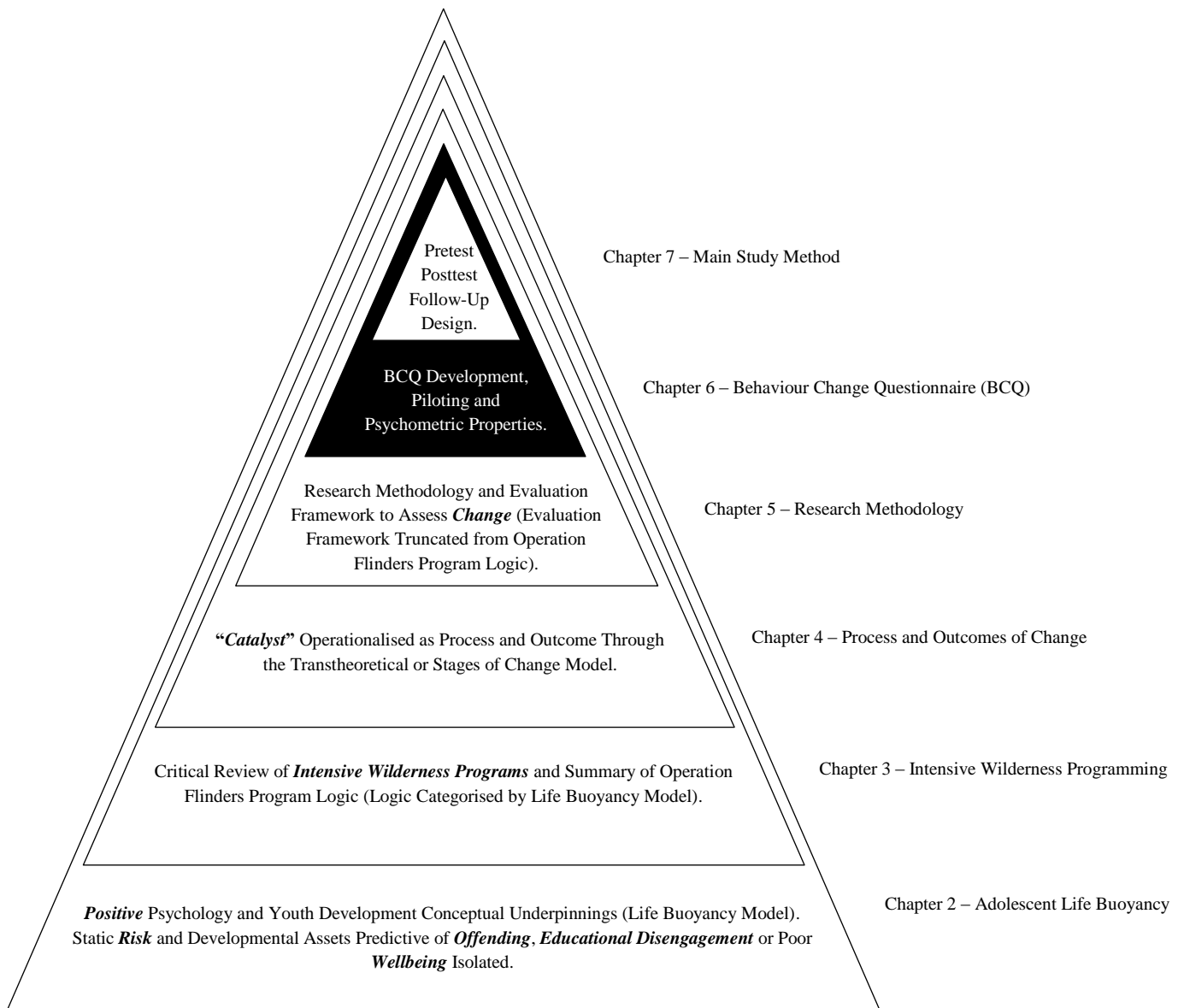
5.9 Summary

This chapter provides the rationale, framework and implementation considerations underpinning the research design. The detailed methodology related to the development of the Behaviour Change Questionnaire (Youth- and Teacher-Report) and the main study, where the research hypotheses and question were systematically assessed, is provided in the Chapters 6 and 7, respectively.

Chapter 6

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
Chapter 9 – Discussion
Chapter 10 - Conclusions



6 Behaviour Change Questionnaire (BCQ)

This chapter summarises the development, piloting and psychometric properties of the Behaviour Change Questionnaire (BCQ; Youth- and Teacher-Report). This tool was designed to assess both behavioural and motivational constructs of educational disengagement; operationalising the processes and outcomes of change specific to the Transtheoretical Model (TM; Prochaska et al., 1992). This chapter provides detailed methodology of the pilot study (including expert engagement). The method by which the BCQ's psychometric data was collected through the main study is articulated in Chapter 7.

6.1 Instrument Design Challenges

A number of challenges were encountered in the design and analysis of the BCQ. These challenges are flagged upfront to support the reader to understand the rationale for the development of a youth- and teacher-report BCQ measure. At the end of the chapter it is concluded that the BCQ provides a “generalised” measure of motivation to change, with the possible confounding effects of “motivation” and “behaviour” not able to be reliably delineated within this research. Reasons that this confounding was unavoidable are provided in this section, and can be attributed to three key challenges encountered in the design process. They are summarised as follows.

1. As noted in Chapter 4, current tools assessing motivation to change assume that the individual has a “problem”, for instance, the client is self-reporting alcohol use, they have been referred to a program or intervention (e.g., drug clinic), or they have been arrested. In the case of the current sample, this assumption was not valid. As noted in this chapter, many young people entered the Operation Flinders program with no self-reported problems related to educational disengagement, and this was cross-validated through teacher-report data. It is possible that they were

referred to the program for problems related to wellbeing or offending, or they did not present with any problems in the first case. For motivation to be assessed, the BCQ had to obtain a reliable assessment of whether or not a young person had a “problem”. Self-report assessment was not possible. For instance, young people may deny the existence of a problem because: (1) they do not have a problem, (2) they demonstrate low problem awareness or (3) they are in a pre-contemplation stage of change. Points 2 and 3 are characterised by low motivation to change (as per TM), and therefore, an independent assessment of student “problems” was required. Given the research implementation was constrained to educational or school contexts, the independent measurement and observation of problems was restricted to this setting. For this reason, the BCQ’s content was restricted to behaviours and problems specific to educational disengagement.

2. A second challenge was the multidimensional nature of educational engagement (see Section 2.3.1.2). That is, it may be operationalised by a young person presenting with one or many problems related to this global construct (e.g., aggression, conduct behaviours, avoidance, truancy). Therefore, the BCQ had to assess motivation to change related to multiple behaviours that had a conceptual and empirical link to this underlying construct. The BCQ was informed by the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ; Rieger & Touyz, 2006; Rieger et al., 2000; Rieger et al., 2002). This tool operationalises the symptoms of anorexia nervosa through the multi-dimensional properties of cognitions, emotions and behaviour. Motivation to change is assessed in relation to the specific underlying properties, including body shape and weight, eating behaviours and treatment engagement (Rieger et al., 2000).

3. As discussed in Chapter 4 (Section 4.5.1), motivation to change measures have been applied to assess “change” or program impact across an intervention. The hypotheses in this research required that this methodology be applied. However, repeated-measure assessments of motivation to change require the same problem behaviour to be at the focus of the individual’s attention at both the pretest and posttest assessment time. Therefore, to uphold internal validity, there was a requirement for assessment measures and processes to be replicated across the two measuring points. Consideration was given to students self-identifying a problem and rating their associated motivation to change across the two points in time. However, given the significant resources and systems required to implement this method (e.g., to ensure that the student was reflecting upon the same problem at both points), this proposition was assessed as not being feasible. Therefore, assessment tools were designed such that they were standardised in design and content, and could be replicated across the two points in time (see Section 6.2).

In summary, matched youth- and teacher-report Behaviour Change Questionnaires were developed to assess the behavioural and motivational constructs specific to educational disengagement manifesting in mainstream school settings. The detailed design considerations underpinning this process are discussed in the next section.

6.2 Instrument Design and Refinement

Section 6.2 summarises the instrument design and refinement process, including the method and results specific to the pilot study. Instrument development is an iterative process that is comprised of a number of interdependent steps (Carretero-Dios & Perez, 2007; DeVellis, 2012; Furr, 2011; Streiner, Norman, & Cairney, 2014; Wilson, 2005; Worthington & Whittaker, 2006). Drawing upon this body of literature, the BCQ was designed and refined through the following four steps: (1) construct mapping, (2) item and scale design, (3) tool

piloting and (4) tool validation. These points are considered in turn, with the reporting of the scale development and validation informed by recommended guidelines (Cabrera-Nguyen, 2010).

6.2.1 Construct Mapping

Clear articulation of the construct and context is a foundational step in instrument development (Carretero-Dios & Perez, 2007; Furr, 2011), and a recommended best-practice consideration (Worthington & Whittaker, 2006). Wilson (2005) titled this process “construct mapping”, which is the coherent definition of the construct/s to be assessed, and the applied operationalisation of the construct for the target population group. Figure 6.1 summarises the aim underpinning the tool design, and the Level 1 and Level 2 constructs operationalising the tool’s aim for the population cohort and setting. As discussed in Section 6.1, the BCQ’s content was restricted to problem behaviours conceptually related to educational disengagement, and it required an independent or teacher-report assessment of “problems”.

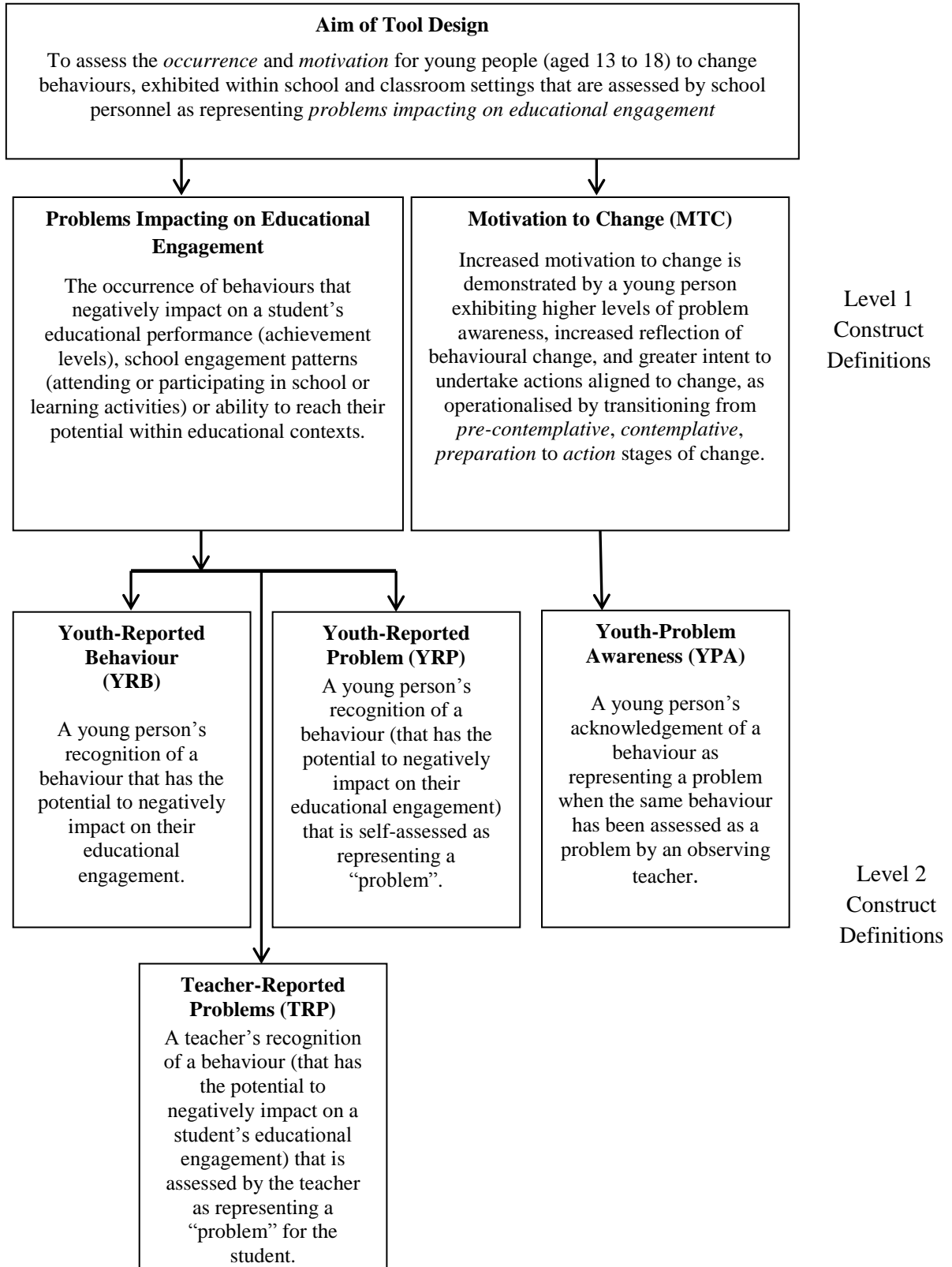


Figure 6.1 Construct map of Behaviour Change Questionnaire

As captured within Figure 6.1, the aim of the BCQ was “to assess the *occurrence* and *motivation* for young people (aged 13 to 18) to change behaviours, exhibited within school and classroom settings that are assessed by school personnel as representing *problems impacting on educational engagement*”. At the next level (Level 1), the tool was designed to assess both *problems impacting on educational engagement* and *motivation to change*. The former was defined as the occurrence of behaviours that negatively impact on a student’s educational performance (achievement levels), school engagement patterns (attending or participating in school or learning activities) or ability to reach their potential within educational contexts. As discussed within Chapter 2 (Section 2.3.1.2), school engagement is a multi-dimensional construct that can be operationalised through behavioural, emotional, cognitive, achievement or psychological dimensions (Fredricks et al., 2004). Given the BCQ was developed to assess both youth- and teacher-report assessment of educational disengagement, the measure restricted its assessment to the behavioural expression of educational engagement. Observer, or teacher-report, assessments of cognitive and emotional experiences are likely to exhibit low reliability (McDonald, 2008), and were contraindicated in the assessment and operationalisation of educational disengagement.

At the Level 1 construct definition, increased motivation to change (MTC) was defined by a young person exhibiting higher levels of problem awareness, increased reflection of behavioural change, and greater intent to undertake actions aligned to change, as operationalised by transitioning from *pre-contemplative*, *contemplative*, *preparation* to *action* stages of change. This construct operationalises the Transtheoretical Model of change (as summarised in Chapter 4). For the reasons specified in Section 4.7 (Chapter 4), the tool restricted its operationalisation to the constructs of problem awareness, cognitive intentions and behavioural activation. For this reason, the stage of *maintenance* was not operationalised within the questionnaire design.

The Level 1 constructs were further operationalised as follows (Level 2 constructs):

- Youth-Reported Behaviour (YRB) – A young person’s recognition of a behaviour that has the potential to negatively impact on their educational engagement (assessed by BCQ Youth-Report). In short, this construct assesses a student’s recognition of their behaviours.
- Youth-Reported Problem (YRP) - A young person’s recognition of a behaviour (that has the potential to negatively impact on their educational engagement) that is self-assessed as representing a “problem” (assessed by BCQ Youth-Report). In short, this construct assesses problem awareness, but with no independent assessment of whether or not the behaviour represents a problem.
- Teacher–Reported Problem (TRP) - A teacher’s recognition of a behaviour (that has the potential to negatively impact on a student’s educational engagement) that is assessed by the teacher as representing a “problem” for the student (assessed by BCQ Teacher-Report).
- Youth Problem Awareness (YPA) – A young person’s acknowledgement of a behaviour as representing a problem (assessed by BCQ Youth-Report), when the same behaviour has been assessed as a problem by an observing teacher (assessed by BCQ Teacher-Report). In short, this construct assesses problem awareness, but with an independent or teacher assessment of whether or not the behaviour represents a problem for the student.

The BCQ was designed to assess the constructs of YPA, YRB, YRP, TRP and MTC.

6.2.2 Item and Scale Design

This step included the articulation of a response format and an initial item pool (Furr, 2011). It is recommended that items should be informed through a careful review of the literature, consultation with content experts and piloting with the sampling cohort (Desselle,

2005). Matched youth- and teacher-report measures were designed to assess YPA, YRB, YRP, TRP and MTC. In the first phase of tool development, a checklist of behaviours characteristic of educational disengagement was initially written by the researcher. Items were constructed with consideration to widely agreed guidelines for item development (for review see Desselle, 2005), including: minimising ambiguous terms, matching items to reading level, avoiding double-barrelled items, and limiting the use of superlatives. A complete list of behaviours purported to negatively impact on educational engagement was sought. The list was formulated with reference to the educational and psychological literature (e.g., Fredricks et al., 2004; Wang et al., 2011), and the researcher's experience as a clinical psychologist. To establish content validity, an initial pool of 15 items, tapping content specific behaviours, was then sent to experts in child and adolescent development (three psychologists) and student wellbeing (two senior South Australian government policy experts). They were asked to provide suggestions for additional items or behaviours that impacted on school performance, attendance, engagement or motivation to learning and academic achievement, with a particular focus on young people aged 13 to 17 who were at risk of becoming disengaged from education. Feedback on the item list, with a strong emphasis on face validity and readability, was also sought.

Two additional items were identified through the expert review. Content matched items were written for the youth- and teacher-report measures, and listed in no particular order (see Table 6.1 for list of pilot items). An important criterion in item design is to ensure that items are personally relevant to the respondent (Desselle, 2005). A Department of Education and Child Development expert in behaviour management suggested that the item tapping conflict and fighting between students be individually tailored to student and teacher respondents. That is, the item content framed on the construct of "fights" for the youth-report, while framed through the words of "conflict" for the teacher-report.

Table 6.1

Items for Youth- and Teacher-Report BCQ Questionnaire (Pilot Study)

Youth-Report	Teacher-Report
Wagging school	Wagging school
Skipping classes	Skipping classes
Refusing to attend school	Refusing to attend school
Anger and aggression at school	Anger and aggression at school
Not following teacher's directions	Not following teacher directions
Refusing to do work in lessons	Refusing to do work in lessons
Leaving classes early	Leaving classes early
Not doing homework	Not doing homework
Attending school when you have used drugs or alcohol	Attending school under the influence of alcohol or drugs
Swearing at other students or the teacher	Swearing at other students or the teacher
Giving up when work gets hard	Giving up when work gets hard
Bullying other students	Bullying other students
Using Facebook or a mobile phone during lessons	Using Facebook or a mobile phone during lessons
Coming to school really tired	Coming to school really tired
Zoning out or daydreaming in lessons	Zoning out or daydreaming in lessons
Causing fights between other students	Setting up conflict between other students in the classroom
Not trying new school work if it looks hard	Not trying new school work if it looks hard
^a Other.....	Other ^a

Note: ^aThe term “other” only appeared in the pilot survey, and was used to elicit additional behaviours or responses.

In the next phase, a rating scale was designed to assess the construct definitions of YRB, YRP, TRP and MTC. Separate rating scales were developed for both the youth- and teacher-reported measures. The youth-report measure was developed on the assumption that young people hold awareness about their actions and behaviour. While there is a strong argument that this level of self-awareness may be unrealistic (Kagan, 1988), the youth-report measure continues to remain a valid tool to assess personal constructions of self (Kagan, 2007). The youth-report measure employed a Guttman rating format with five rating options, with this scale format developed with consideration to the TM literature on staging

algorithms (see Section 4.5.1.1). The rating items are summarised in Table 6.2, along with the TM stage each rating scale operationalises, and the degree each rating option fulfils the YRP and YRB construct definition. As detailed in Chapter 4 (Section 4.7.3), the rating format was also designed to assess motivation to change through the constructs of (1) no problem awareness, (2) problem awareness, (3) cognitive intentions and (4) behavioural activation.

Table 6.2

Rating Options of the Behaviour Change Questionnaire (BCQ) – Youth-Report

	Rating Option	Transtheoretical Model Stage	Construct Definition
1	I don't do this behaviour	n/a	n/a
2	I do this behaviour but I don't see it as a problem	Pre-contemplative stage (no problem awareness)	When selected, YRB definition fulfilled.
3	This is a problem for me, but I don't want to do anything about fixing it	Contemplative stage (problem awareness)	When selected, YRB and YRP definition fulfilled.
4	I am thinking about making changes to fix this problem	Preparation stage (cognitive intentions)	When selected, YRB and YRP definition fulfilled.
5	I am doing things now to fix this problem	Action stage (behavioural activation)	When selected, YRB and YRP definition fulfilled.

An individual behaviour fulfilled the construct definition of YRB when the rating option 2, 3, 4 or 5 was selected. An individual behaviour met the construct definition of YRP when the rating option 3, 4 or 5 was selected. The rating options 2 to 5 were written to operationalise the TM from the *pre-contemplative* to the *action* stages of change, or from problem awareness to behavioural activation. As discussed within Chapter 4, a number of existing measures of motivation operationalising the TM have multiple items tapping specific stages (e.g., Stages of Change Questionnaire by McConaughy et al., 1983). In contrast, the

BCQ assesses motivation to change as a continuous variable, with higher scores indicative of increased motivation to change.

The use of the Guttman rating format warrants further comment. The use of this rating format has been widely criticised within the literature, particularly in the measurement of attitudes (Oskamp & Schultz, 2005). However, as reported by DeVellis (2012):

Guttman scales can work quite well for objective information or in situations where it is a logical necessity to responding positively to one level of a hierarchy implies satisfying all of the lower levels of the hierarchy. Things get murkier when the phenomenon of interest is not concrete. (p. 88)

In the case of the BCQ, the rating scale assesses objective and clearly defined constructs within a logical hierarchical manner, as mapped to a clearly defined model (Transtheoretical Model) and a widely applied assessment methodology (staging algorithms). For this reason, the use of the Guttman rating scale remains supported.

The BCQ was also operationalised as an observer or informant measure, with this providing an independent analysis of personality and behaviour (McDonald, 2008), where judgements are based upon “currently observable reality” (Kenny, 1994, p. 191). The integration of both youth- and observer-report measures provides the opportunity to cross validate the BCQ but, more importantly, increase accuracy in the measurement process (McDonald, 2008), and support an independent assessment or problem awareness (as per rationale provided in Section 6.1, Instrument Design Challenges). The teacher-report BCQ was designed to assess TRP and MTC, and support the assessment of YPA. Unlike the youth-report measure where the rating scale was designed to differentiate “behaviour” (behaviour is present) and “problem” (behaviour represents a problem), the teacher-report only assessed the latter. It was anticipated that the reliability of the teacher-report questionnaire would be reduced by assessing both constructs. That is, if both constructs were assessed simultaneously, it was postulated that observing teachers may construe that the BCQ was

assessing their own construction of student problems, and if this occurred, this would translate to increased social desirability biases.

The BCQ (Teacher-Report) requested the observer to review a list of student behaviour (see items in Table 6.1) and respond to each behaviour in a two-step process. First, to review each behaviour, and to answer the question: “from your perspective, does this represent a problem for the student?” on a dichotomous “yes” versus “no” scale. This scale was designed to operationalise the TRP measure, with the selection of “yes” meeting the requirement that the behaviour fulfilled the TRP construct definition. In the second step, if the response “yes” was selected, the teacher was asked to respond to one of four fixed responses (Guttman rating format). As summarised in Table 6.3, these responses were mapped to the TM and were used to operationalise motivation to change (MTC) as a continuous variable, referenced to the constructs: (1) no problem awareness, (2) problem awareness, (3) cognitive intentions and (4) behavioural activation. The two-step assessment process for the BCQ (Teacher-Report) was designed to minimise missing responses. It was postulated that teachers may not be willing, or have insufficient information, to directly assess motivation. Therefore, if a one-step rating process was applied (as with the youth-report BCQ), there would be higher levels of missing responses.

Table 6.3

Rating Options of the Behaviour Change Questionnaire (BCQ) – Teacher-Report

	Rating Option	Transtheoretical Model Stage
1	This is a problem for the student, but the student does not see it as a problem	Pre-contemplative stage (no problem awareness)
2	The student sees it as a problem, but they are not willing to do anything about fixing it	Contemplative stage (problem awareness)
3	The student has been talking about making changes to fix this problem	Preparation stage (cognitive intention)
4	The student has been observed making changes to fix this problem	Action stage (behavioural activation)

The reliability of observer assessments of motivation requires further comment. The development of the BCQ (Teacher-Report) measure of motivation occurred with reference to matched client-clinician and youth-parent measures within the literature (Cobb, 2011; Hodgins, 2001). However, it is widely recognised that observers have limited capacity to accurately assess “another person’s thoughts, feelings, and motives” (McDonald, 2008, p. 83). Therefore, the rating options: “this is a problem for the student, but the student does not see it as a problem” and “the student sees it as a problem, but they are not willing to do anything about fixing it” tap motivation through attitudinal processes, and therefore rating reliability is dependent on the student verbalising their attitudes to the observer. Meanwhile, the rating options “the student has been talking about making changes to fix this problem” and “the student has been observed making changes to fix this problem” tap behavioural expression of motivation. However, the former item is dependent on the student verbalising their intent to make changes. For the reasons noted, MTC, as assessed by teachers, is likely to be confounded by the nature of the student-teacher relationship. That is, young people are

more likely to disclose their attitudes (e.g., making changes) in the context of relationships characterised by trust and rapport (Gregory & Ripski, 2008). Given this likely confound, the BCQ (Teacher-Report) included the item; “On a scale of 1 to 10, how well do you know the issues and problems facing the student at school?” Responses were sought on a 10-point continuum, with the scale descriptors “not well at all”, “to a small degree”, “moderately well” and “very well”. This item was included to explore the potential confounding nature of teacher-youth relationships on response patterns (with analyses related to this variable reported in Section 6.2.3.3). The BCQ (Youth-Report) and BCQ (Teacher-Report) pilot tools are provided in Appendix E and F, respectively.

6.2.3 Tool Piloting and Content Validity

Pilot testing is an important means to assess tool layout and interpretation, and assess content validity (Lancaster, Dodd, & Williamson, 2004). A crucial process within instrument construction, mapped to the item design phase, is the assessment of respondent feedback, or what Wilson (2005) referred to as “listening to the respondent”. It is suggested that this should occur for participants representing the “likely target population, in a manner reflecting the likely administration context” (Furr, 2011, p. 13).

A pilot study was conducted in 2012 to obtain qualitative feedback on scale format, rating scales and item content. The study also supported the larger outcome evaluation (main study, Chapter 7), specifically to identify barriers and facilitators of participant engagement (Lancaster et al., 2004). There is wide variability in the literature about the best way to conduct pilot studies (Lancaster et al., 2004; Thabane et al., 2010). While there are no hard and fast rules (Desselle, 2005), Lancaster et al. (2004) recommended that pilot studies should have clear objectives. The pilot study had the following three objectives:

1. To review content validity of behavioural items and the fixed rating format for both the youth- and teacher-report BCQ measures.

2. To qualitatively assess participant (youth and teacher) factors that impacted on assessment tool engagement (including questionnaire layout, format and length) and item comprehension.
3. To conduct exploratory analyses of construct validity.

The pilot study included the following features. First, 30 representative respondents from the nominated population group were identified as the minimum number of participants given the scale development objectives (Johanson & Brooks, 2009). Second, the pilot study included a “think aloud” process (or cognitive interview), where participants were asked to verbalise their interpretation of each item (Wilson, 2005). Third, a brief exit interview assessed participant feedback of questionnaire content (Wilson, 2005).

6.2.3.1 Pilot Study Procedure

In mid-2012, the 10 referral agencies participating in the September Operation Flinders program received an introductory letter from Operation Flinders leadership requesting their support for the pilot study. Approximately six weeks before the start of the program, the researcher initiated phone and email contact with a key contact person from each referral agency. This contact introduced the nature of the pilot study and requested support to administer information sheets and consent forms (Appendix C and D). Consent was obtained from the agency manager or school principal (Appendix B). All information sheets and consent forms were posted to the agency for dissemination.

Two weeks before the start of the program, the researcher attended a pre-program information night and requested Operation Flinders program facilitators’ support to have contact with participants during the program. Where facilitators were not able to attend this session, the researcher individually introduced the pilot study processes by email, with follow-up phone contact.

Where consent had been provided, the researcher met with each Operation Flinders participant group on day 7 of the wilderness intervention. This meeting time and location was scheduled at a natural break point (e.g., morning tea, lunchtime). Once the group had settled, and on the cue of the program facilitators, the researcher introduced the pilot study, and paraphrased the contents of the information sheet (e.g., voluntary nature, confidentiality). Portable chairs were set up approximately 15 to 20 metres away from the group. Youth and teacher participants rotated through the assessment point, and completed the BCQ (Youth-Report) and BCQ (Teacher-Report), respectively. The researcher introduced the questionnaire and sought respondents' feedback on whether they would like the questionnaire items read aloud, and where requested, this occurred.

Seventy-one young people provided their consent to complete the BCQ (Youth-Report). They originated from ten different referral sources or schools, with 61% of these schools from regional South Australia. The majority of participants were male (69%), and their mean age was 14.6 (range 12 to 17). Twenty young people completed the "talk-aloud" process (also known as a cognitive interview). This involved the researcher sitting side-by-side with the youth and seeking their feedback on item, scale and questionnaire content. The following were examples of open-ended questions applied in this process. They were dynamically tailored to the specific individual.

- What do you think that item is asking you?
- Why did you answer the question that way?
- What were you thinking when you were answering that question?
- Why did you choose that response?

The talk-aloud process assessed item comprehension. Specifically, the researcher sought to identify items or constructs which required reframing by the researcher, or

interpretations that were not congruent with the matched items from the BCQ (Teacher-Report) or the intended content definition.

For the remaining youth participants, a brief exit interview was conducted. Open-ended questions were provided by the researcher at the point of questionnaire completion, assessing the young person's experience of the BCQ and collective item content. The following were examples of open-ended questions asked within this process.

- How did you find the questionnaire and its content?
- What was the questionnaire about?
- Is there anything in the questionnaire you did not like or found difficult to answer?
- Is there any way the questionnaire could be improved?

Exit interviews elicited qualitative feedback on barriers and facilitators of questionnaire completion, and a broad-based assessment of content validity. It was postulated that content validity would be supported by youth reporting that all the items tapped behaviours elicited within schools that impacted on educational engagement (as per definition in Figure 6.1).

Twelve teacher participants completed the BCQ (Teacher-Report) relating to the 71 young people involved in the pilot study. Teachers originated from 10 referral sources (61% from regional South Australia). A brief exit interview was conducted with all teachers. Open-ended questions at the point of questionnaire completion sought an assessment of content validity. The following were examples of questions applied in this process. They were dynamically tailored to the specific teacher.

- How did you find the questionnaire and its content?
- What was the questionnaire's content about?

- Is there anything in the questionnaire you did not like or found difficult to answer?
- Are there additional behaviours that impact on educational engagement in school or classroom settings?
- Are any of the aforementioned listed behaviours not associated with educational disengagement?
- Is there any way the questionnaire could be improved?

It was postulated that content validity would be supported by teachers reporting that all of the items assessed behaviours elicited within school contexts that impacted on educational engagement (as per definition in Figure 6.1).

6.2.3.2 Pilot Study Instruments

The pilot study was designed to explore construct validity for the YRB, YRP, TRP and MTC scales. Construct validity was hypothesised to be evidenced through high inter-correlations between the YRP, TRP and YRB scales, and other measures that have a theoretical or empirical predictive relationship with the constructs (Desselle, 2005). Given the importance of operationalising motivation to change (MTC) within the research, construct validity was sought through the pilot study. Existing measures of motivation to change, based upon the TM, were considered for inclusion. They were not included for two reasons. First, the length of many of these measures (> 50 items) was assessed as impacting on the student's willingness to engage meaningfully with the talk-aloud and exit interview processes. Second, as noted within Chapter 4 (Section 4.5), existing measures of motivation to change assess singular behavioural problems occurring within clinical and forensic settings (e.g., offending, alcohol use). Given the BCQ sought the assessment of multiple behaviours characteristic of educational disengagement, a robust tool to assess concurrent validity was found not to exist.

Two constructs assessed as having a conceptual and empirical relationship with MTC, YRB, YRP and TRP were help-seeking behaviour and satisfaction with life. A modified version of the General Help Seeking Questionnaire (GHSQ; Wilson, Deane, Ciarrochi, & Rickwood, 2005) and the Satisfaction with Life Scale – Children (Gadermann, 2009) was included within the youth-report pilot questionnaire (see Appendix E).

The GHSQ is designed to assess the intentions of young people to seek help from different people or sources, and in respect to different problem types (Wilson et al., 2005). The tool has been found to demonstrate acceptable reliability and validity, and support modification “according to purpose and need” (Wilson et al., 2005, p. 18), in respect to tailoring the instrument around specific problem type and help sources. In the pilot study, the problem type was restricted to school related problems, reflecting the context of the participant cohort. Respondents were asked: “if you were having a problem which was making your time at school difficult for you, how likely is it that you would seek help from the following people or sources?” A list of 11 different help seeking people and sources was provided (e.g., girlfriend/boyfriend, friend, parent, school teacher, school counsellor), and respondents were asked how likely they would be to seek help from this source on a seven point scale, with the descriptors “extremely unlikely” (1), “unlikely” (3), “likely” (5) and “extremely likely” (7). It was hypothesised that there would be a positive relationship between help-seeking intent and the number of problems reported by young people (YRB, YRP) and teachers (TRP), as empirically supported within the literature (Freyer et al., 2005; Zwaanswijk, Verhaak, Bensing, Van der Ende, & Verhulst, 2003). In addition, it was hypothesised that there would be a positive relationship between higher levels of motivation to change (MTC) and help-seeking intentions, as theoretically supported within the literature (Evans, 2013).

As discussed in Chapter 2, satisfaction with life is a key construct assessing subjective wellbeing (Diener et al., 1985; Pavot & Diener, 2008). It was included within the pilot study for two reasons. First, to assess construct validity of the BCQ. Previous research has found a relationship between higher numbers of problems (e.g., TRP, YRP and YRB) and lower levels of life satisfaction (Lyons et al., 2013). Furthermore, satisfaction with life has been negatively correlated with motivation to change (Shealy, Murphy, Borsari, & Correia, 2007). Second, in the main study (reported in Chapter 7), a brief and reliable assessment of subjective wellbeing was sought. The piloting of a global satisfaction with life measure supported this objective. Participants completed the Satisfaction with Life Scale – Children (SWLS-C). This five-item scale was adapted from the Satisfaction with Life Scale (SWLS; Diener et al., 1985); a widely used and validated measure to assess global life satisfaction in adults (Pavot & Diener, 2008). This SWLS-C employed a 5-point Likert scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”. Scale items included: “The things in my life are excellent”, “I am happy with my life” and “If I could live my life over, I would have it the same way”. All items were positively coded, and higher scores represent increased satisfaction with life. This scale has been found to demonstrate sound psychometric properties for children (M = 11 years) (Gadernann, 2009; Gadernann et al., 2010).

6.2.3.3 Pilot Study Results and Discussion

The results and discussion are categorised under the three objectives of the pilot study. The first objective was “to review content validity of behavioural items and the fixed rating format for both the youth- and teacher-report measures”. Exit interviews were conducted with both youth and teachers following completion of the BCQ. The youth respondents consistently reported that the 17 listed behaviours had the potential to impact on their engagement with school, learning or the teaching environment, and when this occurred,

they had the potential to represent a “problem”. However, youth reported that a number of behaviours, although present, did not always represent a problem. For example, a high proportion of young people reported that “not doing homework” was a presenting behaviour. However, they indicated that their teacher did not want them to do homework, and as such, this behaviour did not represent a problem.

The exit interview with teachers also supported the content validity of the items. There was universal agreement that behaviours had the potential to represent problems impacting on educational engagement (as per definition in Figure 6.1). The BCQ sought an exhaustive list of behavioural problems, and teachers were asked to identify additional items. Early in the interview process, the item “work avoidance” was identified as an important behaviour impacting on educational engagement. This was operationalised as a student taking “taking toilet and drink breaks”. Through subsequent interviews, this item was introduced to teacher respondents, and cross-validation for the item’s inclusion was found. The item “using work avoidance strategies (e.g., toilet and drink and breaks)” was constructed. The term “work avoidance” was readily recognised and comprehended by teachers in the same manner. Through the interview process with youth, this item was introduced, and it was apparent that the term “work avoidance” was comprehended differently by young people. It was subsequently reframed as “avoiding work in lessons (e.g., taking toilet & drink breaks)” and content validity with the teacher-report item was found through the interview process.

The talk-aloud process was applied to assess participant comprehension of the items and rating scale, with a view to assess content validity. The feedback indicated that the youth were able to discriminate the individual items on the Guttman rating scale. That is, they were able to differentiate their willingness to change or modify behaviours, and the degree they viewed the behaviours as representing a problem. There was evidence that young people with lower reading and comprehension capacity required the scale items to be read aloud. Apart

from isolated cases, participants did not ask for the behaviours or scale rating items to be reframed by the researcher (e.g., a respondent saying “what does this mean?”). Taken on a whole, the talk-aloud process elicited consistent evidence to support the BCQ’s content validity.

A second objective of the pilot study was “to qualitatively assess participant (youth and teacher) factors that impacted on assessment tool engagement (including questionnaire layout, format and length) and item comprehension”. “Evidence of a poor response rate, an abundance of questions left blank, and/or unsolicited comments in margin of questionnaire surveys during pilot testing would indicate the need to reword or remove certain questions” (Desselle, 2005, p. 9). The questionnaire completion rate, for both the youth and teacher report measures was high (> 95%), and there was evidence of very few items being left blank. No item had greater than 5% missing data for the youth- and teacher-report measures.

Feedback provided by youth respondents indicated that the BCQ font size was difficult to read and align individual behaviours and rating responses. This elicited frustration in a small number of young people. Respondents indicated that they felt comfortable answering the questions, and that they could be honest in their responses. Through the exit interview, a number of respondents reported that they had reflected upon the behaviours in the “previous months”, and that the two-week period of reflection (as stated in the questionnaire introduction) was overlooked.

A third objective of the pilot study was “to conduct exploratory analyses of construct validity”. Validity is about creating an argument for the instrument or its related constructs (or validity argument), which should include all forms of evidence (Desselle, 2008; Wilson, 2005). Concurrent validity was initially assessed through the inter-correlations between the YRP and TRP, and the YRB and TRP, for each item. This is summarised in Table V.1 (Appendix V), along with the percentage of items recorded as YRB, YRP and TRP.

Concurrent validity between the youth- and teacher-report MTC scores were not able to be assessed at the item level, owing to the small number of items in each category. Table V.1 indicates that the most commonly reported behaviours (YRB) by young people were “coming to school really tired” (70.4%), “not doing homework” (67.6%) and “not following teacher’s directions” (60.6%). The most commonly reported problems (TRP) by teachers were “not following teacher’s directions” (60.9%), “giving up when work gets hard” (50.8%) and “anger and aggression at school” (50.0%). As expected, the percentage of YRB was notably higher than the YRP, indicating that young people do not evaluate all presenting behaviours as representing a problem. Table V.1 provides the inter-item correlations for the TRP/YRB and TRP/YRP constructs. The strongest concordance between items was for “bullying other students” ($\phi = .48, p < .01$), “anger and aggression at school” ($\phi = .44, p < .01$), and “using Facebook or a mobile phone during lessons” ($\phi = .41, p < .01$).

Construct validity was also explored through the inter-correlations between the total scale scores (YRB-Total, YRP-Total, TRP-Total, MTC-Youth & MTC-Teacher scores), and the Satisfaction with Life (SWL) and General Help Seeking Questionnaire (GHSQ) measures. The Satisfaction with Life ($\alpha = .85$) and GHSQ ($\alpha = .77$) demonstrated acceptable levels of internal consistency. The YRB-Total, YRP-Total and TRP-Total were constructed as the total number of behaviours or problems reported by youth or teachers. The MTC-Youth and MTC-Teacher measures were constructed as the mean motivation score for youth or teachers that reported one or more behaviours or problems as present, respectively. Both MTC measures confound behaviour type and motivation, and as such, they require cautious interpretation in the pilot study.

The inter-correlations between scales scores are found in Table 6.4.

Table 6.4

Inter-Correlation Matrix for Pilot Study (r)

	YRP-Total	TRP-Total	MTC-Youth	MTC-Teacher	GHSQ	SWL
YRB - Total	.84	.43	-.15	-.29	-.32	-.41
YRP - Total		.41	.11	-.26	-.27	-.45
TRP - Total			.18	-.56	-.22	-.29
MTC - Youth				.01	.09	-.09
MTC - Teacher					.41	-.03
GHSQ						.07

Note: Bold correlations significant at $p < .01$. Bold and italics correlations significant at $p < .05$. N range 42 to 71.

Supporting concurrent validity, there was a moderately sized and significant correlation between the TRP and YRP/YRB measures ($r > .41$, $p < .01$). Teacher-observers indicated that young people with high levels of observed problems demonstrated a pattern of lower motivation to change (MTC-Teacher) for teacher reported problems (TRP, $r = -.56$, $p < .01$), but also for the YRP ($r = -.26$, $p = .06$, near significant). However, this pattern was not replicated for youth respondents in terms of the TRP and MTC-Youth, where there was a small, non-significant correlation ($r = .18$, $p = .21$). As supported within the broader literature (Lyons et al., 2013), higher number of student problems or behaviours indicative of educational disengagement were associated with lower levels of satisfaction with life, with this replicated for the YRP ($r = -.45$, $p < .01$), YRB ($r = -.41$, $p < .01$) and TRP ($r = -.29$, $p < .05$) measures.

Interestingly, higher number of problems or behaviours indicative of educational disengagement were correlated with young people demonstrating lower willingness to access help seeking relationships, with this consistent for the YRP ($r = -.27$, $p < .05$), YRB ($r = -.32$, $p < .01$) and TRP ($r = -.22$, $p = .08$) measures.

Motivation to change (MTC) as assessed by youth demonstrated no consistent relationship with the behavioural measures (TRP, YRP and YRB), nor was there a significant relationship between this MTC-Youth and help-seeking behaviour ($r = .09$, ns) or satisfaction with life ($r = -.09$, ns). An interesting and important finding from the pilot study was that MTC-Teacher was moderately and positively correlated with the youth-report GHSQ ($r = .41$, $p < .01$). In other words, young people who were more likely to seek help from adults in educational settings were assessed by their teachers as demonstrating the highest levels of motivation to change. This supports the proposition that the observer assessment of motivation to change is influenced by teacher-youth relationship closeness. Supporting this viewpoint, teachers who reported higher levels of confidence in understanding the needs of students at school were associated with a small positive relationship with young people's help seeking intent ($r = .25$, $p = .06$). Collectively, evidence is provided that the observer assessment of MTC may be influenced by student-teacher relationship factors. The reliability of motivation to change, as assessed by teachers, appears moderated by this confound.

In summary, the strongest and most consistent pattern of construct validity was found for the behavioural components of the BCQ (YRP, YRB and TRP). While construct validity for the youth-report MTC measure was not found, cautious interpretation of this outcome is required on two grounds. First, there were a restricted number of validity measures integrated within the pilot study, and second, the assessment of motivation to change was confounded with different problem types within the pilot study. The pilot study has raised questions regarding the reliability of teacher assessments of motivation to change in students. Strong support for the content and construct validity of the BCQ behavioural items (Youth- and Teacher-Report) was found within the pilot study, and for this reason, grounds for the BCQ to be included in the main study were supported.

6.2.3.4 Tool Refinement

Following the piloting, the BCQ (Youth- and Teacher-Report) was updated and refined in the following ways. First, an additional behavioural item was added which tapped the construct of work avoidance. This included the item: “avoiding work in lessons (e.g., taking toilet & drink breaks” in the BCQ (Youth-Report) and the item “using work avoidance strategies (e.g., toilet & drink breaks)” in the BCQ (Teacher-Report).

Second, greater attention was paid to the design and presentation of the questionnaire. Dillman (2007) noted that there are six visual components that influence how respondents read, compartmentalise and answer a set of questions on a page. This included: “location (or spacing between elements), shape, size, brightness (shading or colour), simplicity and regularity, and a consistent figure-ground format” (p. 96). Applying these principles, the format of the BCQ (Youth-Report) was moved from “landscape orientation” to “portrait orientation”. Also, the font size was increased and shadowing was used to delineate items. This occurred to promote ease of reading and to reduce the cognitive load (or requirement to attend to individual items) of questionnaire completion.

Third, in the pilot study, a small number of young people circled multiple scale responses on the BCQ (Youth-Report). In response, the line “Please circle only one response” was included in the scale descriptor. Furthermore, key sections of the questionnaire descriptor were written in bold to bring greater attention to the length of observation associated with the BCQ (previous two weeks).

6.3 Instrument Testing and Validation

The updated versions of the BCQ (Youth- and Teacher-Report) were administered within a battery of youth- and teacher-report measures within the main study (program evaluation). The method employed to administer the BCQ, at two points in time, is provided in Chapter 7. The battery of measures assessed static risk predictors, demographic variables,

and a range of psychological, attitudinal and behavioural outcomes (as mapped to evaluation framework, Figure 5.1). The BCQ (Youth-Report) was completed by young people attending the Operation Flinders program ($n_{\text{pretest}} = 325$, $n_{\text{posttest}} = 276$), and control group participants ($n_{\text{pretest}} = 191$, $n_{\text{posttest}} = 159$). The BCQ (Teacher-Report) were completed by teachers assessing observations related to both young people attending the Operation Flinders program ($n_{\text{pretest}} = 283$, $n_{\text{posttest}} = 222$) and control group participants ($n_{\text{pretest}} = 171$, $n_{\text{posttest}} = 147$). The following sections of this chapter summarise the descriptive and psychometric properties of the instrument.

6.3.1 Data Re-Coding and Composite Measures

Collectively, the BCQ was designed to assess Youth Reported Behaviour (YRB), Youth Reported Problems (YRP), Teacher Reported Problems (TRP), Youth Problem Awareness (YPA) and Motivation to Change (MTC). Measures of these constructs were developed from recoded items from the BCQ Youth- and Teacher-Report measures in the following manner.

6.3.1.1 Youth-Reported Behaviour (YRB)

All behavioural items on the BCQ (Youth-Report) were recoded dichotomously, with “0” indicating that the behaviour was not present, while “1” indicated that the behaviour was present. That is, the response “I don’t do this behaviour” was coded as a “0”, while the responses, “I do this behaviour but I don’t see it as a problem”, “this is a problem for me, but I don’t want to do anything about fixing it”, “I am thinking about making changes to fix this problem” and “I am doing things now to fix this problem”, were recoded as “1”.

6.3.1.2 Youth-Reported Problem (YRP)

All BCQ (Youth-Report) behavioural items were recoded dichotomously with “0” indicating the behaviour was not assessed by the youth as representing a problem, while “1”

indicated that the behaviour was assessed as representing a problem. That is, the responses “I don’t do this behaviour” and “I do this behaviour but I don’t see it as a problem” were recoded as “0”. Meanwhile, the responses: “this is a problem for me, but I don’t want to do anything about fixing it”, “I am thinking about making changes to fix this problem” and “I am doing things now to fix this problem”, were recoded as ‘1’. All behaviours recoded as a “1” fulfilled the YRP construct criteria (as per definition in Figure 6.1).

6.3.1.3 Teacher Reported Problems (TRP)

All behavioural items on the BCQ (Teacher-Report) were recoded dichotomously with “0” indicating that behaviour did not represent a problem, while “1” indicated the behaviour did represent a problem. All behaviours recoded as a “1” fulfilled the TRP construct criteria (as per definition in Figure 6.1).

6.3.1.4 Youth Problem Awareness (YPA)

YPA was defined as “a young person’s acknowledgement of a behaviour as representing a problem, when the same behaviour was assessed as a problem by an observing teacher” (Figure 6.1). In other words, YPA was achieved when the same behavioural item fulfilled the construct criteria for YRP and TRP at the same time, across the youth and teacher-report BCQ’s measures, respectively. Given YPA was constructed from YRP and TRP cross-item comparisons, there were four possible coding categories as summarised in Table 6.5. *Matched awareness* was achieved when there was concordance between the youth and teacher item responses. In other words, both the teacher and student simultaneously agreed that a behaviour did or did not represent a problem. Meanwhile, *low awareness* was evidenced when the teacher reported a behaviour represented a problem and the youth did not report a problem. In contrast, *high awareness* was achieved when the teacher did not report the behaviour was a problem, however, the student reported that the behaviour was a problem. The YPA scale is formed on the following two assumptions:

- Students and teachers comprehend the word “problem” in the same manner.
- Both teachers and students are accurately assessing the same behaviour.

Given these assumptions, there is a higher risk of instrument measurement errors, given that errors in one or both assessment processes (e.g., self- and observer-report measures) may interact and aggregate with one another (Furr, 2011). This limitation of the tool is discussed and reviewed in more detail in Section 9.3.2.3 (Chapter 9).

Table 6.5

Possible Cross-Scale Coding Matches between YRP and TRP

Teacher (TRP)	Youth (YRP)	
	Not a problem	Problem
Not a problem	Matched awareness (1)	High awareness (2)
Problem	Low awareness (0)	Matched awareness (1)

The research sought a composite measure that assessed problem awareness across all 18 items. As shown in Table 6.5, matching responses were coded “0”, “1” or “2”, respectively, and a mean problem awareness scale score was formed with a possible range from 0 to 2. Scores < 1 indicated lower levels of problem awareness, while higher scores (>1) indicated higher levels of problem awareness. It should be noted, however, that higher scores may not represent adaptive psychological or behavioural functioning. That is, the cognitive inflating of problems may be indicative of mood or psychological disturbances (Beck, 1979; Beck, 1995; Kraaij et al., 2003).

6.3.1.5 Motivation to Change (MTC)

Motivation to change was operationalised in three ways within the validation phase. It was operationalised applying teacher-report data, youth-report data and a combination of both

data sources. For each way, items of the BCQ (Youth- and Teacher-Report) were recoded as follows.

- “0” – behaviour was not reported as present on the BCQ (Youth-Report), or the behaviour was not assessed as a problem on the BCQ (Teacher-Report).
- “1” - behaviour present, but student does not see it as a problem.
- “2” - behaviour present and student considers the behaviour a problem, but does not want to do anything about fixing it.
- “3” – behaviour present, and student is talking (BCQ Teacher-Report) or thinking (BCQ Youth-Report) about making changes to fix this problem.
- “4” – the youth is doing things to fix this problem.

6.3.2 Descriptive Properties

The descriptive properties of the BCQ are summarised in Table 6.6.

Table 6.6

BCQ Youth- and Teacher-Report Item Frequency Data and Cross-Item Correlations Between TRP and YRP (Pretest Matched Sample, N = 391)

	YRB	YRP	TRP/ YRP	TRP	
Youth-Report	%	%	(ϕ)	%	Teacher-Report
Wagging school	30.1	16.6	.25	31.3	Wagging school
Skipping classes	33.4	18.5	.30	33.9	Skipping classes
Refusing to attend school	31.7	18.2	.23	25.6	Refusing to attend school
Anger and aggression at school	46.1	29.6	.23	36.2	Anger and aggression at school
Not following teacher's directions	53.1	35.2	.30	53.2	Not following teacher's directions
Refusing to do work in lessons	47.3	31.9	.30	51.4	Refusing to do work in lessons
Leaving classes early	33.2	16.2	.15	30.7	Leaving classes early
Not doing homework	68.2	44.5	.15	64.8	Not doing homework
Attending school when you have used drugs or alcohol	8.9	5.4	-.06	8.3	Attending school under the influence of alcohol or drugs
Swearing at other students or the teacher	50.6	27.5	.24	34.4	Swearing at other students or the teacher
Giving up when work gets hard	56.3	37.1	.14	61.3	Giving up when work gets hard
Bullying other students	19.7	12.3	.20	29.6	Bullying other students
Using Facebook or a mobile phone during lessons	61.4	31.8	.23	43.6	Using Facebook or a mobile phone during lessons
Coming to school really tired	76.7	44.4	.07	37.1	Coming to school really tired
Avoiding work in lessons (e.g., taking toilet & drink breaks)	53.9	28.3	.06	42.1	Using work avoidance strategies (e.g., toilet & drink breaks)
Zoning out or daydreaming in lessons	70.8	39.6	.05	55.7	Zoning out or daydreaming in lessons
Causing fights between other students	22.1	12.9	.18	29.5	Setting up conflict between other students in the classroom
Not trying new school work if it looks hard	36.7	23.6	.20	53.2	Not trying new school work if it looks hard

Note: Bold correlations significant at $p < .01$.

As noted in Table 6.6, there was wide variation in the frequency (%) of youth reported behaviour (YRB). For example, 76.7% of young people reported “coming to school really tired”, while 8.9% reported that they had “attended school under the influence of alcohol or drugs”. The column TRP of Table 6.6 summarises the percentage of young people assessed by teachers with problems indicative of educational disengagement. The most frequently cited problems were “not doing homework” (64.8%), “giving up when work gets hard” (61.3%), and “zoning out or daydreaming in lessons” (55.7%).

Overall, while the pattern and frequency of cross-item YRB and TRP scoring was similar, students rated the behavioural expression of tiredness, swearing, zoning out or daydreaming in lessons, and using Facebook or a mobile phone during lessons, at a much higher rate (>15% differential) compared to the TRP ratings. It is important to note that the YRB construct is assessing youth-reported behaviour (e.g., behavioural recognition), while the TRP construct is assessing teacher-reported problem (e.g., problem recognition). It is likely that teachers may recognise behaviours at higher frequencies in students, however, they may not assess the behaviour as representing a problem. However, when the YRP and TRP ratings were compared, apart from the item tapping tiredness, this differential reporting was negated. In other words, on 17 of the 18 items, behaviours were rated as “problems” at higher levels by teachers (compared to students), with the comparative differential being greater than 14% on 12 items.

In summary, the cross-item comparisons between the youth- and teacher-report BCQ measures indicate that students recognise their behaviours (YRB) at a similar frequency to the degree teachers assess behaviours as representing a “problem” in students (TRP). However, students are less likely to assess these behaviours as representing a “problem”, compared to teachers that rate student behaviours as representing a problem at

a much higher level. In short, this disparity talks to the distinction between behaviour recognition (YRB) and problem recognition (YRP) in students. For this reason, the assessment of youth problem awareness (YPA) is an important construct to assess and operationalise within the BCQ.

Table 6.6 also summarises the correlations (ϕ) between YRP and TRP across all matched subscale items. There was a pattern of low to negligible cross-item correlations ($< .30$) suggesting that teachers and students assess behavioural problems differently. Alternatively, it cannot be ruled out that this indicates measurement errors in either the youth- or teacher-report BCQ measures.

MTC scores were also compared across matched items for the BCQ measures. Table 6.7 summarises the mean motivation to change score for cases where (1) young people reported a behaviour present (YRB) and (2) teachers reported that a behaviour was indicative of a problem (TRP). Across the pretest period, the highest frequency of matched responses were for “not doing homework” ($n = 179$), “giving up when work gets hard” ($n = 147$), “not following teacher’s directions” ($n = 142$), and “zoning out or daydreaming in lessons” ($n = 158$). Conversely, items tapping drug use ($n = 4$), bullying ($n = 38$), causing fights ($n = 34$) and leaving class early ($n = 49$) had a pattern of lower matched responses.

Table 6.7

Descriptive and Comparative Analysis of BCQ Youth- and Teacher-Report Motivation to Change Items (Pretest Matched Sample, N = 392)

	Youth-Report			Teacher-Report		<i>r</i>	<i>t</i>
	<i>n</i>	Mean	SD	Mean	SD		
Wagging school	58	2.19	1.19	1.90	.91	.34	<i>t</i> (57) = -1.82, <i>p</i> = .07
Skipping classes	62	2.37	1.16	2.05	1.06	.05	<i>t</i> (61) = -1.65, <i>p</i> = .10
Refusing to attend school	51	2.18	1.09	1.92	.91	.03	<i>t</i> (50) = -1.30, <i>p</i> = .20
Anger and aggression at school	81	2.38	1.16	2.41	1.01	.31	<i>t</i> (80) = .17, <i>p</i> = .86
Not following teacher's directions	142	2.32	1.09	2.00	.99	<.01	<i>t</i>(141) = -2.60, <i>p</i> = .01
Refusing to do work in lessons	127	2.43	1.07	2.13	.99	.02	<i>t</i>(126) = -2.33, <i>p</i> = .02
Leaving classes early	49	2.16	1.18	2.02	.95	-.17	<i>t</i> (48) = -.61, <i>p</i> = .54
Not doing homework	179	2.32	1.14	1.91	.92	.11	<i>t</i>(178) = -4.01, <i>p</i> < .001
Attending school when you have used drugs or alcohol	4	1.00	0.00	2.25	.50	n/a	<i>t</i>(3) = 5.00, <i>p</i> = .02
Swearing at other students or the teacher	87	2.22	1.08	2.13	1.02	.01	<i>t</i> (86) = -.58, <i>p</i> = .57
Giving up when work gets hard	147	2.36	1.15	1.99	.94	-.07	<i>t</i>(146) = -2.95, <i>p</i> < .01
Bullying other students	38	2.39	1.15	1.84	.89	.22	<i>t</i>(37) = -2.65, <i>p</i> = .01
Using Facebook or a mobile phone during lessons	129	2.00	1.02	1.74	.95	.17	<i>t</i>(128) = -2.37, <i>p</i> = .02
Coming to school really tired	116	2.32	1.21	2.03	.95	.22	<i>t</i>(115) = -2.25, <i>p</i> = .03
Avoiding work in lessons (e.g., taking toilet & drink breaks)	96	2.02	1.12	1.64	.84	.05	<i>t</i> (95) = -2.77, <i>p</i> < .01
Zoning out or daydreaming in lessons	158	2.08	1.08	1.91	.95	.19	<i>t</i> (157) = -1.65, <i>p</i> = .10
Causing fights between other students	34	2.35	1.04	1.62	.82	.02	<i>t</i>(33) = -3.27, <i>p</i> < .01
Not trying new school work if it looks hard	92	2.29	1.10	1.98	.89	.10	<i>t</i>(91) = -2.24, <i>p</i> = .03

Note: Bold correlations significant at $p < .01$. Bold and italics correlations significant at $p < .05$.

Across 16 of the 17 items¹⁴, the mean MTC score for the BCQ (Youth-Report) was higher than the BCQ (Teacher-Report), and this was statistically significant for 10 items (matched t-tests $p < .05$). Table 6.7 also summarises the correlations (r) for MTC scores across the matched items. There was a pattern of low to negligible cross-item correlations ($< .34$). Interestingly, there was a small negative correlation between teacher and youth ratings for the item “leaving classes early” ($r = -.27, p < .01$), suggesting that teachers and students assess motivation to change very differently on this item.

Taken on a whole, the low cross-item MTC correlations between the youth- and teacher-report BCQ could be attributable to one of the following reasons: (1) the two tools are measuring different constructs, (2) one or both tools demonstrate low precision in the assessment of MTC or (3) there are confounding biases in the assessment of the construct. In support of point three, the pilot study found that MTC assessed by teachers was positively associated with help-seeking intent in young people, suggesting that teacher-youth relationship closeness was a moderator of MTC scores. It is noted that young people are more likely to disclose their attitudes (e.g., making changes) in the context of relationships characterised by trust and rapport (Gregory & Ripski, 2008). Taken on a whole, the internal validity of observer or teacher assessment of a student’s thoughts, feelings and motives is questioned (McDonald, 2008). For this reason, MTC as assessed through the BCQ (Teacher-Report) is not examined further in this thesis.

6.3.3 Scale Properties and Factor Analysis

The BCQ (Youth- and Teacher-Report) exhibited an unknown factor structure. Factor analysis was employed to identify latent variables that are reflected in the independent constructs (Bandalos & Finney, 2010). In Chapter 7 (Section 7.3.2.1), the decision making process (and supporting background evidence) the researcher made in

¹⁴ The item tapping drug and alcohol use is not included in this comparison given its low matched response rate ($n = 4$) and the risk that spurious comparisons may be reported.

conducting factor analyses reported within this thesis are detailed. This section summarises the Exploratory Factor Analyses (EFA) for the BCQ (Youth- and Teacher-Report), with separate factor analyses conducted for all scale items coded as Youth-Reported Behaviour (YRB), Youth-Reported Problem (YRP) and Teacher-Reported Problem (TRP).

6.3.3.1.1 Youth-Reported Behaviour (YRB)

The factorability of the scale items was evidenced by (1) the moderate inter-item correlations (Table W.1), (2) the KMO criteria being met (.91), (3) Bartlett's test of sphericity being significant ($\chi^2(153) = 2723.51, p < .001$) and (4) the anti-image correlation matrix exhibiting high diagonal correlational loadings.

Principal Axis Factoring (PAF) was used as the extraction method, with cases restricted to the pretest assessment ($n = 458$). Three factors had eigenvalues > 1 and an inspection of the scree plot showed a clear flattening effect after three factors were extracted. Factors one, two and three explained 41.8%, 9.0% and 8.9% of the variance respectively. Oblimin (with Kaiser Normalization) and varimax rotations were conducted for the three factor solution, and a consistent factor structure was identified across rotations. Given the small inter-factor correlations ($r < .28$), the oblimin rotation was applied for the final solutions to aid interpretability.

In the next phase of data reduction, six items were removed as the primary loadings were $< .50$, a benchmark indicative of a strong factor loading (Costello & Osborne, 2005). These included: "attending school when you have used drugs or alcohol", "refusing to do work in lessons", "using Facebook or a mobile phone during lessons", "avoiding work in lessons (e.g., taking toilet & drink breaks)", "not doing homework" and "refusing to attend school". PAF was again conducted, and the item "leaving classes early" failed to reach a primary loading $> .50$, and was also removed from the final solution. The final PAF (oblimin rotation) was conducted with the remaining 11 items and the three factor solution

explained 60.2% of the variance. All items had primary loadings above .56, and there were no cross loadings $> .30$. The final factors were named and defined as follows:

- *Classroom Avoidance* – this two item¹⁵ measure includes the constructs of wagging school and skipping class. Higher scores are indicative of self-reported behaviours related to classroom avoidance.
- *Externalising Behaviours* - this seven-item measure assesses behaviours that are directed externally at both teachers and peers, including anger, swearing, work refusal and avoidance, aggression, bullying and not following direction. Higher scores are indicative of self-reported behaviours related to externalising problems exhibited within school settings.
- *Mental Alertness* – this two item measure includes the constructs of tiredness and daydreaming. Higher scores are indicative of self-reported behaviours related to being mentally present and alert within class and school settings.

The item factor loadings and communalities are presented Table 6.8. As summarised in Table 6.9, the factors were moderately correlated, with higher numbers of behaviours related to classroom avoidance (skipping and wagging) also associated with higher levels of externalising behaviours ($r = .51, p < .001$) and behaviours associated with higher levels of mental absence ($r = .28, p < .01$). The Mental Absence and Externalising Behaviours measures exhibited a small positive relationship ($r = .33, p < .01$).

6.3.3.1.2 Youth-Reported Problems (YRP)

The factorability of the scale items was evidenced by (1) the inter-item correlations (Table W.2), (2) the KMO criteria being met (.88), (3) Bartlett's test of sphericity being

¹⁵ By definition, two-item measures do not constitute a scale. The psychometric rigour of the brief measures used in the study are critically reviewed and discussed throughout this thesis.

significant ($\chi^2(153) = 2658.37, p < .001$) and (4) the anti-image correlation matrix exhibiting high diagonal correlational loadings.

Principal Axis Factoring (PAF) was used as the extraction method, with cases restricted to the pretest assessment ($n = 458$). Three factors had eigenvalues > 1 and an inspection of the scree plot showed a clear flattening effect after three factors were extracted. Factors one, two, three and four explained 32.9%, 8.6%, 7.7% and 5.8% of the variance respectively. Oblimin (with Kaiser Normalization) and varimax rotations were conducted for the two, three and four factor solutions. The two and four factor solutions were not supported owing to lack of coherent interpretability and low primary loadings ($< .5$) on individual solution factors, respectively. The three solution factor matched the solution found with the YRB items. The oblimin rotation was applied for the final solution to aid interpretability.

In the next phase of data reduction, the same six coded items identified in the previous section (YRB) were removed as the primary loadings $< .50$. The final PAF (oblimin rotation) was conducted with the remaining 11 items and the three factor solution explained 59.5% of the variance. All items had primary loadings above $.52$, and there were no cross loadings $> .30$. The item factor loadings and communalities are presented in Table 6.8 (parentheses). As summarised in Table 6.9, the factors were moderately correlated (parentheses), with higher problems related to classroom attendance (skipping and wagging) also associated with higher levels of externalising behaviours ($r = .41, p < .001$) and problems with mental alertness ($r = .22, p < .01$).

Table 6.8

Factor Loadings and Communalities on a Principal Axis Factoring Analysis (with Oblimin Rotation) for YRB and YRP Coded Items of BCQ (Youth-Report) (N = 458)

	Factor			Communality
	Classroom Avoidance	Externalising Behaviours	Mental Absence	
Wagging school	.76 (.82)			.59 (.65)
Skipping classes	.77 (.76)			.67 (.66)
Anger and aggression at school		.68 (.65)		.45 (.42)
Not following teacher's directions		.67 (.72)		.51 (.52)
Refusing to do work in lessons		.58 (.65)		.42 (.48)
Swearing at other students or the teacher		.65 (.59)		.46 (.43)
Bullying other students		.65 (.58)		.35 (.29)
Causing fights between other students		.57 (.52)		.55 (.29)
Not trying new school work if it looks hard		.56 (.54)		.36 (.36)
Coming to school really tired			.74 (.74)	.38 (.54)
Zoning out or daydreaming in lesson			.58 (.64)	.39 (.45)

Note: Factor loadings < .3 are suppressed. YRP coded items reported in brackets.

Table 6.9

Inter-Factor Correlations of BCQ (Youth-Report) – YRB and YRP Items

	Mental Absence	Classroom Avoidance
Externalising Behaviours	.33 (.33)	.51 (.41)
Mental Absence		.28 (.22)

Note: All correlations are significant at the .01 level (two-tailed). YRP coded items reported in brackets.

6.3.3.1.3 Teacher Reported Problems (TRP)

The factorability of the scale items was assessed. Support for EFA was evidenced by (1) the inter-item correlations (Table W.3), (2) the KMO criteria being met (.90), (3)

Bartlett's test of sphericity being significant ($\chi^2(153) = 3613.51, p < .001$) and (4) the anti-image correlation matrix exhibiting high diagonal correlational loadings.

Principal Axis Factoring (PAF) was used as the extraction method, with cases restricted to the pretest assessment ($n = 383$). Three factors had eigenvalues > 1 and an inspection of the scree plot showed a flattening effect after three factors were extracted. Factors one, two and three explained 34.6%, 8.4% and 7.3% of the variance respectively. Oblimin (with Kaiser Normalization) and varimax rotations were conducted for the two, three and four factor solutions. The two and four factor solutions were not supported owing to the high cross-factor loadings (two-factor solution) and the lack of primary loadings $> .3$ for one factor relating to the four factor solution. The varimax and oblimin rotations demonstrated a consistent factor structure for the three-factor solution, and given the moderate inter-factor correlations ($r > .48$), the oblimin rotation was applied for the final solution to aid interpretability.

In the next phase of data reduction, five items were removed because of low primary loadings ($< .50$). These included: "not following teacher's directions", "attending school under the influence of alcohol or drugs", "coming to school really tired", "using Facebook or a mobile phone during lessons", and "using work avoidance strategies (e.g., toilet and drink breaks)". The item "zoning out or daydreaming in lessons" was also removed given its comparatively low primary loading (.56), compared to the other items, and that it did not achieve a content fit with the other four scale items. The final PAF (oblimin rotation) was conducted with the remaining 12 items and the three factor solution explained 70.1% of the variance. All items had primary loadings above .56, and there were no cross loadings $> .30$. The final factors were named and defined as follows:

- *School and Classroom Avoidance* – this four item measure assesses the constructs of wagging school, refusing to attend class, leaving class early and

skipping class. Higher scores are indicative of teacher-reported problems related to school and classroom attendance.

- *Interpersonal Problems* - this four item measure assesses behaviours that are directed externally to both teachers and peers, including anger, swearing, bullying and setting up conflict. Higher scores are indicative of teacher-reported problems related to negatively expressed interpersonal behaviour.
- *Work Avoidance* – this four item measure taps the constructs of refusing to do work, giving up, not doing homework and not trying. Higher scores are indicative of teacher-reported problems related to work avoidance.

The item factor loadings and communalities are presented Table 6.10. As summarised in Table 6.11, the factors were moderately correlated, with a higher number of problems related to class and school avoidance patterns (e.g., skipping, school refusal, leaving early wagging) also associated with higher levels of interpersonal problems ($r = .50, p < .001$) and work avoidance ($r = .50, p < .001$). In other words, young people presenting with work and classroom avoidance problems are also likely to present with interpersonal problems within school. The Work Avoidance and School and Classroom Avoidance measures were moderately positively correlated ($r = .48, p < .001$).

Table 6.10

Factor Loadings and Communalities on a Principal Axis Factoring Analysis (with Oblimin Rotation) for TRP Coded Items of BCQ (Teacher-Report) (N = 383)

	Factor			
	School and Classroom Avoidance	Interpersonal Problems	Work Avoidance	Communality
Wagging school	.95			.78
Skipping classes	.68			.62
Refusing to attend school	.70			.53
Leaving classes early	.57			.55
Anger and aggression at school		.59		.57
Swearing at other students or the teacher		.65		.59
Bullying other students		.82		.63
Setting up conflict between other students in the classroom		.81		.61
Refusing to do work in lessons			.70	.67
Not doing homework			.56	.39
Giving up when work gets hard			.92	.74
Not trying new school work if it looks hard			.78	.64

Note: Factor loadings < .3 are suppressed.

Table 6.11

Inter-Factor Correlations of BCQ (Teacher-Report)

	School and Classroom Avoidance	Interpersonal Problems
Work Avoidance	.48	.50
School and Classroom Avoidance		.50

Note: All correlations are significant at the .01 level (two-tailed).

6.3.3.2 *Youth Problem Awareness (YPA)*

YPA is a composite scale formed from both YRP and TRP items. The factorability of the scale items was assessed. Support for EFA was evidenced by (1) the KMO criteria being met (.89), (2) Bartlett's test of sphericity being significant ($\chi^2(153) = 1829.17, p < .001$) and (4) the anti-image correlation matrix exhibiting moderately high diagonal correlational loadings.

Principal Axis Factoring (PAF) was used as the extraction method, with cases restricted to the pretest assessment. Four factors had eigenvalues > 1 and an inspection of the scree plot showed a flattening effect after one factor had been extracted. Factors one to four explained 43.8% of the variance. Oblimin (with Kaiser Normalization) and varimax rotations were conducted for the two, three and four factor solutions. The four-factor solution had only one item with a primary loading $> .50$ on any factor. The three factor solution had no items with a primary loading $> .50$ on any factor, while the two factor solution exhibited a pattern of low primary loadings with no coherent or readily defined factor structure. In summary, it was assessed that the YPA exhibited no coherent factor structure, and for this reason, only the total scale score is applied and reported within this thesis.

6.3.4 **Confirmatory Factor Analysis**

Confirmatory factor analysis (CFA) was applied to determine the extent to which the data fitted the three factor solutions for both the youth- and teacher-report BCQ measures. Maximum likelihood estimation was used to estimate the model fit. It is important to note that the χ^2 statistic, the main measure of model fit, is sensitive to sample size. With large samples, as noted within the current research, the value is also likely to be bigger and the model more likely to be rejected (Hair, Black, Babin, Anderson, & Tatham, 2006). CFA were separately conducted with AMOS (Version 19) for the YRP, YRB and

TRP data sets for both the pretest and posttest assessment periods. Table 6.12 summarises the model fit indices (without post-hoc modifications) relating to all models.

Table 6.12

Confirmatory Factor Analyses of the Three-Factor Solutions for YRB, YRP and TRP Items

	χ^2	df	χ^2/df	<i>p</i>	CFI	NFI	RMSEA
BCQ Youth Report Behaviours (YRB-Pretest)	132.90	44	3.02	<.01	.94	.92	.06
BCQ Youth Report Behaviours (YRB-Posttest)	136.15	44	3.09	< .01	.94	.91	.07
BCQ Youth Report Problems (YRP-Pretest)	163.29	42	3.89	< .01	.92	.90	.08
BCQ Youth Report Problems (YRP-Posttest)	136.06	42	3.24	<.01	.93	.91	.07
BCQ Teacher Report Problems (TRP-Pretest)	341.65	52	6.57	<.01	.89	.88	.11
BCQ Teacher Report Problems (TRP-Posttest)	216.19	51	4.24	<.01	.92	.90	.09

Note. RMSEA = root mean square error of approximation. NFI = Normed Fit Index. Comparative Fit Index (CFI).

According to widely accepted protocols, CFI and NFI values in excess of .90 support acceptable model fit (Hair et al., 2006). Furthermore, acceptable ranges for the χ^2/df ratio are between 2:1 to 5:1 (Marsh & Hocevar, 1985) and RMSEAs should be $\leq .05$ (Hair et al., 2006). Given the model fit indices reported within Table 6.12 were outside of these parameters, post-hoc modifications were performed in an attempt to develop better fitting and more harmonious models. Improved model fit was sought by adding covariances between the items (pertaining to AMOS modification indices relating to within factor items of error variances > 15) and items were removed where they had very low factor loadings ($< .70$). Table 6.13 summarises the CFA model fit indices for the three factor solutions, relating to the Youth- and Teacher-Report BCQ measures, following post-hoc modification. The item “refusing to attend school” was removed from both the TRP scales (pertaining to factor: School and Classroom Avoidance). The items “bullying other students” and “causing fights between students” were removed from the YRB and YRP scales as both items consistently loaded $< .74$ on the factor Externalising Behaviours. The removal of items was supported as both factors had > 3 items per factor.

Table 6.13

*Confirmatory Factor Analyses of the Three-Factor Solutions for YRB, YRP and TRP Items**After Post Hoc Modifications*

	χ^2	df	χ^2/df	<i>p</i>	CFI	NFI	RMSEA
BCQ Youth Report Behaviours (YRB-Pretest)	47.14	26	1.81	<.01	.98	.96	.04
BCQ Youth Report Behaviours (YRB-Posttest)	29.80	26	1.15	.28	.99	.98	.02
BCQ Youth Report Problems (YRP-Pretest)	54.90	22	2.50	<.01	.98	.96	.05
BCQ Youth Report Problems (YRP-Posttest)	44.04	23	1.92	<.01	.98	.96	.05
BCQ Teacher Report Problems (TRP-Pretest)	83.55	38	2.20	<.01	.98	.97	.05
BCQ Teacher Report Problems (TRP-Posttest)	97.99	38	2.58	<.01	.97	.95	.06

Note. RMSEA = root mean square error of approximation. NFI = Normed Fit Index. Comparative Fit Index (CFI).

As summarised in Table 6.13, post hoc modifications assisted in improving model fit across all models, with the fit indices being near or meeting the acceptable range. Given the relative stability of factor structure (across two assessment periods), support is provided that YRB, TRP and MTC can be operationalised and assessed through both combined (total scale) and latent factor measures. Given the improved model fit, the resultant five-item YRB Externalising Behaviour measure and the three-item TRP School and Classroom Avoidance measure were applied within the main study, and these revised measures are reported in the subsequent sections of the thesis.

6.3.5 Development of Motivation to Change (MTC) Measure

A key outcome of this research was the development of a motivation to change measure, as operationalised through the TM. Within the literature, motivation to change is assessed for singular “problems” through staging algorithms, rating formats or visual analogs (see Chapter 4). As discussed at the start of this chapter, three key challenges were encountered in the tool development process. The final BCQ (Youth- and Teacher-Report) assessed constructs specific to: (1) behaviour recognition (YRB), (2) problem awareness (TPR and YRP) and (3) motivation to change (MTC).

Two key decision making points were encountered in the construction of the motivation to change measure. They were whether or not to:

1. Assess MTC at the item (or individual behaviour/problem level) versus the factor level.
2. Assess MTC for youth-reported behaviours (YRB) versus MTC for teacher-reported problems (TRP).

In reference to point 1, a decision was made to assess MTC at the factor level. This decision was made for two reasons. First, the inclusion of 18 single-item dependent measures within the main study was not feasible (given the large number of pre-existing dependent measures). Second, there are broader concerns regarding the internal validity of single item measures (Brewer, 2000).

In reference to point 2, a decision was made to operationalise MTC for both YRB and TRP, and then assess construct validity of both measures prior to including the measures in the main study. The following section details the construction and operationalisation of both constructs.

6.3.5.1 Motivation to Change – Youth Reported Behaviour (MTC-YRB)

The MTC-YRB operationalises motivation to change for all behaviours that fulfilled the YRB criteria, and only applying youth-report BCQ data. Composite measures were developed for the following constructs: (1) Classroom Avoidance, (2) Externalising Behaviour, (3) Mental Alertness and (4) Total Behaviours. These four constructs were formed via the following two steps. In the first step, behaviours that did not meet the YRB criteria for that measure (e.g., a young person reported that the behaviour was not present) were recoded as missing values and not included in the formation of the composite scale. In the second step, the mean score of the remaining items were calculated with a possible range from 1 to 4 (as per the coding detailed in Section 6.3.5.1). Higher scores represent

increased levels of motivation to change. The individual constructs were defined as follows:

- *YRB-MTC (Classroom Avoidance)* – A young person’s average motivation to change behaviours related to classroom avoidance (wagging school, skipping class) that have the potential to impact on educational engagement, and are self-reported as occurring at school.
- *YRB-MTC (Externalising Behaviours)* – A young person’s average motivation to change behaviours that relate to externalising behaviours (anger, swearing, work refusal and avoidance, aggression, bullying and not following teacher direction) that have the potential to impact on educational engagement, and are self-reported as occurring at school.
- *YRB-MTC (Mental Alertness)* – A young person’s average motivation to change behaviours that relate to mental alertness (tiredness and/or daydreaming) that have the potential to impact on educational engagement, and are self-reported as occurring at school.
- *YRB-MTC (Total Behaviours)* – A young person’s average motivation to change behaviours that have the potential to impact on educational engagement, and are self-reported as occurring at school.

6.3.5.2 Motivation to Change – Teacher-Report Problems (MTC-TRP)

The MTC-TRP operationalised motivation to change for all behaviours that fulfilled the TRP criteria, but applying the youth’s assessment of their willingness to change through the youth–report BCQ. Composite measures were developed for the following constructs: (1) School and Classroom Avoidance, (2) Interpersonal Problems, (3) Work Avoidance and (4) Total Problems. These four constructs were formed via the following two steps. In the first step, behaviours on the BCQ (Teacher-Report) that did not

meet the TRP criteria were recoded as missing values and not included in the formation of the composite measure. Second, the mean score of the remaining matched items on the BCQ (Youth-Report) was calculated with a possible range from 0 to 4 (as per coding detailed in Section 6.3.5.1). Higher scores represent increased levels of motivation to change. The individual constructs were defined as follows:

- *TRP-MTC (School and Classroom Avoidance)* – A young person’s average motivation to change behaviours specific to school and classroom avoidance that are assessed by the teacher as a problem impacting on the young person’s educational engagement (including wagging school, refusing to attend class, leaving class early and skipping class).
- *TRP-MTC (Interpersonal Problems)* - A young person’s average motivation to change behaviours specific to interpersonal problems that are assessed by the teacher as a problem and impacting on the young person’s educational engagement (including anger, swearing, bullying and setting up conflict).
- *TRP-MTC (Work Avoidance)* – A young person’s average motivation to change behaviours specific to work avoidance that are assessed by the teacher as a problem impacting on the young person’s educational engagement (including refusing to do work, giving up, not doing homework and not trying).
- *TRP-MTC (Total)* – A young person’s average motivation to change behaviours that are assessed by the teacher as a problem/s impacting on the young person’s educational engagement.

6.3.5.3 Internal Validity of Motivation to Change Constructs

The internal validity of the MTC measures is of particular importance to this research. Unlike existing tools operationalising the Transtheoretical Model, the BCQ

assesses a multidimensional construct (educational engagement), where the assumption that presenting behaviours represent a “problem” is not met. Therefore, for the reasons noted at the start of this chapter, when factor level constructs are applied to operationalise motivation to change, the tool has the potential to confound behaviour (or problem) and motivation to change. Therefore, the internal validity of the motivation to change measures applied in this research is predicated on the following being met.

1. Individual behavioural (YRB or TRP) items load strongly onto their latent constructs, and the individual factors exhibit strong internal consistency.
2. MTC does not substantially vary as a function of the individual behaviours within the construct or measure.
3. The TRP and YRB factors demonstrate construct validity.
4. The MTC measures demonstrate construct validity with measures conceptually or empirically related to motivation to change.

For the remainder of this chapter, the reader’s attention is drawn to psychometric and descriptive evidence specific to the above four points, and the psychometric properties of the MTC constructs are summarised at the end of this chapter.

6.3.6 Scale Descriptive Properties

This section provides the descriptive, reliability and validity data specific to BCQ and its sub-factors. However, from this point forward, the YRP sub-scales are not reported for the following reasons. First, exploratory analyses found that the YRP subscales, compared to the YRB subscales, demonstrated a pattern of smaller correlations with the other BCQ factors, static risk indices and dependent measures reported in this research. Second, given the YRB criteria are also fulfilled with the YRP criteria, the two constructs are not sufficiently independent to warrant separate inclusion with the main study. The

psychometric properties of the YRP-Total scale are reported in the subsequent sections of this thesis to provide evidence for the previous two points.

Table 6.14 summarises the descriptive properties and internal consistency (Cronbach's Alpha) of the total and individual factors related to the BCQ (Youth- and Teacher-Report). Knapp and Mueller (2010) argued that, within the social and behavioural sciences, reliability coefficients above the range of .7 to .8 are considered acceptable. Apart from the YRB Mental Absence measure ($\alpha_{\text{pretest}} = .60, \alpha_{\text{posttest}} = .54$), the internal consistency of the youth- and teacher-report BCQ scales ranged from $\alpha = .67$ to $\alpha = .93$ (moderate to excellent range of internal consistency).

All scales in Table 6.14 were examined for skewness and kurtosis to assess the fit between the distribution of these variables and the assumption of normality. The majority of skewness and kurtosis values were $< \pm 1$ and thus were within the acceptable range to suggest normality. A visual inspection of the histogram was conducted for all scales outside of this range, and apart from evidence of marginal positive and negative skewing, the assumption of normality was generally supported.

Table 6.14

Descriptive Statistics for the Behaviour Change Questionnaire (Youth- and Teacher-Report)

	Pretest						Posttest					
	n	Mean	SD	Skewness	Kurtosis	α	n	Mean	SD	Skewness	Kurtosis	α
BCQ Youth Report Behaviours (YRB)												
Total	501	8.00	4.85	.19	-.90	.89	438	7.20	4.64	.35	-.83	.87
Classroom Avoidance	500	.64	.84	.77	-1.14	.77	436	.61	.83	.84	-1.00	.76
Externalising Problems	502	2.34	1.87	.11	-1.49	.87	438	2.05	1.86	.33	-1.34	.83
Mental Absence	503	1.48	.74	-1.02	-.45	.60	439	1.41	.75	-.85	-.74	.54
BCQ Youth Report Problems (YRP)												
Total	501	4.74	4.32	.86	.01	.88	438	4.56	4.26	.93	.10	.87
BCQ YRB Motivation (YRB-MTC)												
Total	479	2.16	.88	.41	-.81	n/a ^a	418	2.22	.94	.36	-1.01	n/a ^a
Classroom Avoidance	201	2.12	1.17	.45	-1.37	.90	170	2.24	1.19	.26	-1.55	.90
Externalising Behaviours	380	2.22	1.01	.25	-1.17	.81	296	2.25	1.02	.31	-1.11	.81
Mental Absence	427	2.07	1.03	-.54	-.97	.72	368	2.19	1.07	.35	-1.22	.72
BCQ Teacher Report Problems (TRP)												
Total	444	7.24	5.37	.31	-.96	.92	384	5.17	4.99	.81	-.31	.90
School and Classroom Avoidance	438	.96	1.20	.76	-1.09	.82	377	.73	1.10	1.15	-.28	.83
Work Avoidance	450	2.31	1.64	-.32	-1.54	.85	388	1.67	1.59	.30	-1.49	.83
Interpersonal Problems	446	1.75	2.00	.67	-.96	.84	388	.87	1.34	1.33	.39	.83
BCQ TRP Motivation (TRP-MTC)												
Total	335	1.41	.92	.45	-.41	n/a ^a	241	1.50	1.02	.45	-.49	n/a ^a
School and Classroom Avoidance	164	1.07	1.21	.89	-.40	.79	102	1.21	1.30	.81	-.56	.93
Work Avoidance	294	1.52	1.16	.44	-.72	.67	188	1.56	1.21	.38	-.93	.68
Interpersonal Problems	195	1.16	1.13	.62	-.71	.71	155	1.16	1.23	.79	-.51	.73
Youth Problem Awareness												
Total	392	.89	.33	-.28	.29	.88	318	.98	.29	-.51	.90	.85

Note: ^aChronbach's Alpha is not reported owing to small number of cases where motivation to change scores were scored for all 18 behaviours.

6.3.6.1 *Test-Retest*

As a measure of test-retest reliability, the control group's pretest-posttest correlations are summarised in Table 6.15. This provides a measure of the stability of the measurements across an 8- to 10-week period. The composite measures (YRB-Total, YRP-Total, TRP-Total) demonstrated the largest test-retest coefficients ($r > .71, p < .01$). Greater levels of variation were evidenced across the individual subscales, with the YRB Mental Absence demonstrating low test-retest properties ($r = .47, p < .01$), in comparison to the other YRB subscale measures. This result suggests that tiredness and daydreaming, as reported by young people within school settings, is less stable in presentation compared to other youth behaviours (e.g., classroom avoidance and externalising behaviour). Overall, the scales demonstrated an acceptable level of test-retest reliability.

Table 6.15

Control Group Pretest-Posttest Correlations (r)

BCQ Youth-Report Behaviours (YRB)	
Total	.81
Classroom Avoidance	.71
Externalising Behaviours	.77
Mental Absence	.47
BCQ Youth-Report Problems (YRP)	
Total	.76
BCQ Motivation (YRB-MTC)	
Total	.57
Classroom Avoidance	.50
Externalising Behaviours	.45
Mental Absence	.60
BCQ Teacher-Report Problems (TRP)	
Total	.71
School and Classroom Avoidance	.67
Work Avoidance	.65
Interpersonal Problems	.61
BCQ Motivation (TRP-MTC)	
Total	.69
School and Classroom Avoidance	.70
Work Avoidance	.57
Interpersonal Problems	.61
Youth Problem Awareness (YPA)	
Total	.66

Note: All correlations significant at the .01 level (two-tailed).

6.3.6.2 Construct Validity

Validity is the creation of an argument (or validity argument) for the use of an instrument or its related constructs (Desselle, 2005; Strauss & Smith, 2009). While this argument should include all forms of evidence, the evidence is often ambiguous in nature (Strauss & Smith, 2009). In the development of the BCQ, item construct validity was supported through the expert review and cognitive interviews with students and teachers (pilot study). As previously noted, both processes supported the item content against the initial construct definitions (Figure 6.1). Construct validity is also supported through the factor loadings reported earlier in this chapter. Further evidence to assess construct validity

was obtained through inter-scale BCQ correlations, and correlations between BCQ scales and both the static risk indices and dependent measures applied within the main study (Chapter 7). This is reviewed as follows.

6.3.6.2.1 Inter-Scale Correlations of the BCQ (Youth- and Teacher-Report)

Inter-scale correlations of the BCQ (Youth- and Teacher-Report) are summarised in Table 6.16. This table requires cautious interpretation, with consideration given to the variables comprising individual scales. Specifically, the coding and construction of the TRP-MTC scales warrants comment. This scale measures a young person's motivation to change behaviours that are reported by the teacher as representing a problem. The scale is coded such that when a young person reports that a behaviour is not present (e.g., they are denying that any behaviour exists, and when the teacher has reported that this behaviour represents a "problem"), the item is coded "0". When the behaviour is reported as present (but they don't see it as a problem), the behaviour is coded "1". The codes of "2", "3" and "4" are matched to the TM stages of change. In short, codes 1 to 4 also meet the construct definition for the YRB measure. As noted within Table 6.16, there are small to moderate levels of cross-factor correlations ($.12 < r < .38$, $p < .05$) between the YRB scales (YRB-Total, YRB-Classroom Avoidance, YRB-Externalising Behaviours) and the TRP scales (TRP-Total, TRP-Work Avoidance, TRP-School and Classroom Avoidance, TRP-Interpersonal Problems). Given this correlational pattern, and that both the YRB and TRP-MTC scales have items re-coded from an original BCQ item (see Section 6.3.5), the scales are not fully independent. In reflection of this point, the moderate to strong correlations between the YRB and TRP-MTC scales are likely to be inflated ($.21 < r < .74$, $p > .01$). Cross factor correlations between the YPA and the other BCQ scales are likely to be inflated for the same reason.

Table 6.16

Inter-Scale Correlations of the BCQ (Youth- and Teacher-Report)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
BCQ Youth-Report Behaviours (YRB)																		
1 Total		.71	.88	.55	.72	.03	-.11	.04	.04	.35	.33	.31	.24	.63^a	.53^a	.55^a	.50^a	.23^a
2 Classroom Avoidance			.51	.28	.53	.06	.17	.07	.04	.25	.38	.12	.16	.42^a	.74^a	.30^a	.31^a	.17^a
3 Externalising Behaviours				.33	.63	.02	-.18	.05	.00	.38	.29	.37	.31	.55^a	.36^a	.52^a	.56^a	.15^a
4 Mental Absence					.38	-.01	-.09	.01	.13	.06	.03	.07	.00	.44^a	.21^a	.28^a	.22^a	.21^a
BCQ Youth-Report Problems (YRP)																		
5 Total						.55^a	.42^a	.53^a	.50^a	.26	.26	.24	.17	.79^a	.60^a	.70^a	.61^a	.49^a
BCQ Youth-Report Behaviours - Motivation (YRB-MTC)																		
6 Total							.69	.87	.79	.08	.12	.07	.03	.52	.30	.43	.43	.31^a
7 Classroom Avoidance								.53	.37	-.01	.12	.08	-.12	.42	.76	.20	.21	.25^a
8 Externalising Behaviours									.53	.10	.11	.06	.10	.50	.27	.41	.43	.28^a
9 Mental Absence										.04	.10	.01	.00	.52	.17	.27	.36	.32^a
BCQ Teacher-Report Problems (TRP)																		
10 Total											.78	.82	.78	.03	-.07	.03	.05	-.71^a
11 School and Classroom Avoidance												.50	.48	.08	.18	.08	.06	-.52^a
12 Interpersonal Problems													.50	.07	-.01	.02	.06	-.57^a
13 Work Avoidance														-.05	-.15	-.02	.05	-.59^a
BCQ Teacher-Report Problems - Motivation (TRP-MTC)																		
14 Total															.68	.81	.67	.56^a
15 School and Classroom Avoidance																.35	.33	.47^a
16 Interpersonal Problems																	.33	.50^a
17 Work Avoidance																		.41^a
Youth Problem Awareness (YPA)																		
18 Total																		

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at the $p < .05$. This table requires cautious interpretation, with consideration given to the specific variables and coding of each scale.

^aThe interpretation of these correlations requires the highest levels of caution (given items between both scales are not independent).

Examining Table 6.16, there is a pattern of larger correlations for scales completed by the same source (e.g., youth or teacher), and between latent factors (or subscales) underpinning the YRB, TRP and MTC constructs. Concurrent validity was found for all behavioural measures (YRB, YRP and TRP). There was a small to moderate correlation between the YRB- and TRP-Total scales ($r = .35, p < .01$), and a smaller correlation between the YRP- and TRP-Total scales ($r = .26, p < .01$). The YRB Classroom Avoidance and TRP School and Classroom Avoidance scales were moderately correlated ($r = .38, p < .01$), and this was also replicated for the YRB Externalising Behaviours and TRP Interpersonal Problems subscales ($r = .37, p < .01$). Concurrent validity for the BCQ is found as these scales include a number of matched youth and teacher-report BCQ items. The YRB-Mental Absence measure was not correlated with any of the TRP scales ($r < .07, p > .05$), suggesting independence between the other behavioural constructs.

No consistent correlational pattern was found for the YRB-MTC measures. The YRB-MTC assesses a young person's motivation to change behaviours the young person reports as present at school. Contrary to expectations, young people who reported higher levels of behaviours (on the total or individual YRB subscales) did not demonstrate a generalised pattern of increased levels of motivation to change (see Section 4.5.1.6). Similarly, young people who were assessed by teachers as presenting with higher levels of problems (on the total or individual TRP subscales) did not demonstrate a consistent pattern of higher levels of motivation to change (on the YRB-MTC subscale). These results are in contrast to research that generally supports a positive relationship between problem intensity (or number of problems) and motivation to change (e.g., Shealy et al., 2007; Slesnick, Dashora, Letcher, Erdem, & Serovich, 2009). However, there was some evidence of this relationship being supported at the factor level. For example, young people reporting a higher number of behaviours indicative of classroom avoidance (YRB), were likely to be more

motivated to change this pattern ($r = .17, p < .05$). Second, young people presenting with a higher number of behaviours indicative of mental absence also reported a higher level of motivation to change ($r = .13, p < .01$). In contrast, young people reporting a higher number of externalising behaviours were less motivated to address behaviours related to classroom avoidance ($r = -.18, p < .05$).

The strongest pattern of correlational evidence was found for the MTC-TRP scales. There was a consistent pattern of correlations ($.21 < r < .74, p < .01$) between the TRP-MTC measures and the YRB-Total and individual subscales. When a teacher indicated the presence of one or more “problems” for a young person (as assessed on a TRP Total or subscale), higher levels of youth-reported motivation to change was found for young people who reported higher number of behaviours indicative of educational disengagement. In other words, when a teacher recognised there was a problem, and the student reported a higher frequency of behaviours present (whether it was assessed as a problem or not), this was associated with higher levels of youth-reported motivation to change. This result is consistent with the literature where motivation to change is positively correlated with increased number of behavioural problems (see Section 4.5.1.6).

6.3.6.2.2 Correlations Between BCQ, Static Risk Indices and Dependent Measures

In the main study, the BCQ was integrated within a battery of measures assessing constructs conceptually related to offending, educational engagement and wellbeing in young people. This section draws the reader’s attention to the correlational evidence assessing the construct validity of the BCQ. A detailed summary of each assessment measure, including method of administration, is provided in Chapter 7. Appendix Z (Table Z.1) provides a summary of each measure’s definition and construction. Appendix X (Table X.5) provides a complete correlation matrix of all outcome measures, demographic variables and static risk predictors employed within the research.

Table 6.17 summarises the point-biserial correlations between static risk indices and the BCQ scales. As expected, higher scores on the YRB-Total was associated with a youth-report history of criminal conviction ($r = .33, p < .01$) and school suspension ($r = .43, p < .01$), pre-program offending ($r = .34, p < .01$), pre-program alcohol consumption ($r = .34, p < .01$) and pre-program truancy ($r = .47, p < .01$). A moderately strong correlation was found between the YRB-Total and school suspension or exclusion occurring in 2013, as reported on a South Australian Government electronic database ($r = .35, p < .01$). While this pattern of correlations was replicated for the TRP scales and the six risk indices, the size of the correlations was marginally smaller ($r < .39$). Collectively, this pattern of results is consistent with the literature that supports the relationship between school disengagement, at-risk behaviour and offending tendencies (Andrews & Bonta, 2010a; Henry et al., 2012). In short, further evidence for the construct validity of the behavioural components of the BCQ is found.

Table 6.17

Point-Biserial Correlations (r) Between Static Risk Indices and BCQ Measures (Pretest)

	Pre-program criminal conviction	Pre-program offending	Pre-program alcohol consumption	Pre-program truancy	Pre-program suspension	Suspension or exclusion in 2013 (DECD)
BCQ Youth-Report Behaviours (YRB)						
Total	.33	.34	.34	.47	.43	.35
Classroom Avoidance	.35	.28	.35	.63	.31	.27
Externalising Behaviours	.27	.30	.23	.35	.45	.39
Mental Absence	.09	.11	.17	.16	.12	.03
BCQ Youth-Report Problems (YRP)						
Total	.27	.32	.26	.36	.32	.22
BCQ Youth-Report Behaviours - Motivation to change (YRB-MTC)						
Total	.06	.07	-.01	.04	.05	.03
Classroom Avoidance	.00	.05	.04	.02	-.03	-.03
Externalising Behaviours	.10	.11	.04	.03	.15	.07
Mental Absence	-.01	.06	.02	.01	-.01	-.04
BCQ Teacher-Report Problems (TRP)						
Total	.23	.18	.17	.28	.36	.26
School & Classroom Avoidance	.21	.15	.21	.39	.27	.18
Interpersonal Problems	.22	.13	.07	.23	.33	.23
Work Avoidance	.18	.16	.15	.15	.35	.28
BCQ Teacher-Report Problems - Motivation (TRP-MTC)						
Total	.17	.15	.21	.27	.24	.16
School & Classroom Avoidance	.17	.20	.15	.52	.21	.18
Interpersonal Problems	.11	.15	.16	.22	.21	.08
Work Avoidance	.22	.19	.24	.20	.39	.28
Youth Problem Awareness						
Total	.01	.07	.06	.04	-.08	-.04

Note: Bold correlations significant at $p < .01$. Bold and italics correlations significant at $p < .05$. Number of participants for each measure is reported in Table 6.14.

Discriminant validity pertaining to the individual YRB measures was found, with preliminary evidence that this also extended to the TRP measures. Discriminant validity is evidenced when a construct is not strongly correlated with other constructs that are not empirically or conceptually related (Campbell & Fiske, 1959). As noted within Table 6.17, the size of the correlations between the static risk indices and individual subscales differed

across measures, and in the expected direction (given their conceptual relationship). For example, classroom and school avoidance was most strongly associated with pre-program school truancy for both the YRB ($r = .63, p < .01$) and TRP ($r = .39, p < .01$) measures, in comparison to the other YRB ($r < .35$) and TRP ($r < .23$) measures, respectively.

Furthermore, the YRB-Externalising Behaviours subscale, in comparison to the other YRB subscales, exhibited the largest correlations with pre-program suspension ($r = .45, p < .01$) and recorded suspensions and exclusions ($r = .39, p < .01$). Given this subscale taps behaviours (e.g., anger, swearing, work refusal and avoidance, aggression, bullying and not following direction) that are likely to elicit sanctions by school personnel, construct validity is supported. In contrast, the TRP-Mental Absence measure, assessing the constructs of daydreaming and tiredness, demonstrated a pattern of small to negligible relationships with the risk indices. This suggests that this construct demonstrates greater independence from the other factors that have a stronger behavioural focus.

Table 6.17 indicates that there are no consistent correlational patterns between the four YRB-MTC scales and the risk indices. However, of note, higher motivation on the YRB-MTC Externalising Behaviour subscale was associated with recent offending behaviour ($r = .11, p < .05$), and a history of school suspension ($r = .15, p < .01$). In contrast, the TRP-MTC scales demonstrated a consistent pattern of small positive correlations between increased levels of motivation and all risk indices. That is, increased motivation to change (TRP-MTC Total) was associated with a pre-program history of criminal conviction ($r = .17, p < .01$), suspension ($r = .24, p < .01$), recent school truancy ($r = .27, p < .01$), offending behaviour ($r = .15, p < .01$), alcohol consumption ($r = .21, p < .01$), and an electronic record of suspension or exclusion occurring in 2013 ($r = .16, p < .01$). These results are consistent with evidence indicating a relationship between problem severity and motivation to change (e.g., Shealy et

al., 2007; Slesnick, Dashora, et al., 2009). Youth Problem Awareness (YPA) demonstrated no relationship with any of the risk indices ($r < .08$, ns).

Table 6.18 summarises the pretest correlations between all the BCQ measures and the dependent measures employed within the main study (refer to Appendix Z for measure definitions). In light of the large number of correlations, only summary themes are reported. Young people who reported a higher number of behaviours indicative of educational disengagement (YRB-Total and subscales) were more likely to identify with criminal others ($.20 < r < .45$, $p < .01$), demonstrate more negative attitudes to police and teachers ($-.14 > r > -.36$, $p < .01$), exhibit higher levels of aggression ($.26 < r < .57$, $p < .01$), present with lower levels of self-esteem, optimism, self-efficacy, satisfaction with life and have lower levels of identification with intrinsic values ($-.15 > r > -.43$, $p < .01$). This correlational pattern was also evidenced for the TRP scales, although the correlations were smaller ($r < .26$), and on a number of occasions they failed to reach significance. Taken on a whole, this pattern of results is consistent with research that indicates that school-based behavioural problems are associated with lower levels of subjective wellbeing (Lewis et al., 2011; Park, 2004b) and increased levels of oppositional and at-risk behaviour, including offending (Andrews & Bonta, 2010a). In short, construct validity for the behavioural components of the BCQ is further supported.

Table 6.18

Correlations (r) between BCQ Composite Measures and Main Study Dependent Measures (Pretest)

	Identification with Criminal Others	Attitudes to Police	Attitudes to Teachers	Aggressive Impulses	Satisfaction with Life	Optimism	Self- Efficacy	Self- Esteem	Intrinsic Value Orientation	Extrinsic Value Orientation	BASE Total
BCQ Youth-Report Behaviours (YRB)											
Total	.45	-.36	-.38	.57	-.35	-.32	-.43	-.28	-.30	.03	-.44
Classroom Avoidance	.38	-.33	-.21	.37	-.27	-.18	-.27	-.19	-.20	.00	-.27
Externalising Behaviours	.38	-.30	-.35	.56	-.29	-.28	-.36	-.20	-.32	.04	-.46
Mental Absence	.20	-.14	-.20	.26	-.27	-.27	-.33	-.30	-.15	-.06	-.11
BCQ Youth-Report Problems (YRP)											
Total	.26	-.20	-.14	.39	-.23	-.21	-.26	-.23	-.05	.06	-.34
BCQ Youth-Report Behaviours (YRB) - Motivation											
Total	-.06	.10	.24	-.01	-.05	.02	.07	-.06	.21	-.04	-.08
Classroom Avoidance	-.13	.07	.18	-.14	-.01	.13	.03	-.10	.25	-.04	-.12
Externalising Behaviours	-.03	.09	.19	.06	-.10	-.03	.03	-.08	.21	-.01	-.13
Mental Absence	-.02	.08	.17	-.01	-.03	.02	.06	-.07	.18	-.01	.04
BCQ Teacher Report Problems (TRP)											
Total	.16	-.14	-.18	.26	-.11	-.11	-.17	-.07	-.08	.04	-.68
School & Classroom Avoidance	.18	-.14	-.06	.21	-.09	-.07	-.13	-.08	-.08	.00	-.44
Work Avoidance	.11	-.11	-.21	.15	-.02	-.04	-.13	-.00	-.08	.01	-.67
Interpersonal Problems	.12	-.09	-.15	.29	-.07	-.10	-.09	-.06	-.05	.08	-.48
BCQ Teacher Report Problems (TRP) - Motivation											
Total	.20	-.09	-.06	.30	-.20	-.21	-.25	-.23	-.05	-.02	-.21
School & Classroom Avoidance	.19	-.12	-.15	.15	-.08	-.07	-.15	-.15	-.03	.04	-.21
Work Avoidance	.19	-.07	-.03	.21	-.21	-.16	-.22	-.17	-.04	-.01	-.18
Interpersonal Problems	.13	-.13	.07	.38	-.15	-.22	-.13	-.17	-.05	-.03	-.20
Youth Problem Awareness											
Total	.07	-.00	.07	.06	-.07	-.03	-.04	-.08	.05	.01	.37

Note: Bold correlations significant at $p < .01$. Bold and italics correlations significant at $p < .05$.

Table 6.18

Correlations (r) between BCQ Composite Measures and Main Study Dependent Measures (Pretest) (continued)

	BASE - Student Initiative	BASE- Social Attention	BASE - Success/ Failure	BASE - Social Attraction	BASE - Self- Confidence	Educational Risk Taking	School unexplained absences (2013)	School explained absences (2013)	School attendance rate (2013)
BCQ Youth-Report Behaviours (YRB)									
Total	-.39	-.42	-.37	-.32	-.40	-.42	.19	.25	-.31
Classroom Avoidance	-.26	-.24	-.21	-.22	-.24	-.27	.29	.20	-.33
Externalising Behaviours	-.42	-.48	-.40	-.26	-.41	-.43	<i>.12</i>	.25	-.26
Mental Absence	-.08	-.09	-.07	-.13	-.11	-.08	.10	.11	-.14
BCQ Youth-Report Problems (YRP)									
Total	-.30	-.31	-.30	-.26	-.30	-.31	<i>.12</i>	.14	-.20
BCQ Youth-Report Behaviours (YRB) - Motivation									
Total	-.07	-.04	-.11	-.11	-.02	-.05	.02	.01	-.03
Classroom Avoidance	-.11	-.06	-.10	-.11	-.12	-.12	.08	-.09	.01
Externalising Behaviours	-.11	-.10	-.20	-.12	-.05	-.09	.00	.03	-.02
Mental Absence	.07	.04	-.01	-.04	.04	.06	-.05	-.01	.04
BCQ Teacher-Report Problems (TRP)									
Total	-.62	-.66	-.61	-.46	-.57	-.66	.34	.25	-.39
School & Classroom Avoidance	-.41	-.40	-.39	-.33	-.34	-.44	.48	.28	-.52
Work Avoidance	-.67	-.63	-.53	-.41	-.55	-.70	.24	.17	-.26
Interpersonal Problems	-.37	-.57	-.50	-.27	-.40	-.43	.09	.18	-.17
BCQ Teacher-Report Problems (TRP) - Motivation									
Total	-.16	-.16	-.22	-.20	-.18	-.16	.07	.05	-.10
School & Classroom Avoidance	-.22	-.10	-.16	-.21	-.20	-.18	.27	.05	-.23
Work Avoidance	-.15	-.18	-.15	-.13	-.15	-.15	.06	-.01	-.05
Interpersonal Problems	-.12	-.21	-.31	-.13	-.16	-.16	.08	.12	-.14
Youth Problem Awareness									
Total	.35	.38	.33	.23	.29	.38	-.17	-.16	.17

Note: Bold correlations significant at $p < .01$. Bold and italics correlations significant at $p < .05$.

Apart from the YRB-Mental Absence measure, higher scores on the YRB scales were associated with lowered levels of self-esteem as expressed within the classroom settings, as measured by the Behavior Academic Self-Esteem (BASE) and its subscales ($-.21 > r < -.48, p < .01$), lower levels of positive educational risk taking ($-.27 > r > -.43, p < .01$), a higher number of authorised (explained) and non-authorised (non-explained) school absences in 2013 ($.12 < r < .29, p < .05$), and lowered levels of school attendance overall ($-.14 > r > -.33, p < .01$). This correlational pattern was also evidenced for the TRP scales, although the correlations were consistently larger in size between the teacher-report BASE and educational risk taking measures. Further evidence is provided that measures completed by the same source (teacher or youth) demonstrated larger correlational patterns, in comparison to scales completed by different sources. Collectively, given these correlations tap behavioural components of school and educational engagement, and occurred in the expected direction, further evidence of construct validity for the TRP and YRB scales is found.

Discriminant validity is also evidenced in Table 6.18; further supporting the operationalisation of the YRB and TRP through their latent constructs. For example, as expected, in comparison to the other TRB and YRB subscales, the YRB-Externalising Behaviours measure demonstrated the largest correlations with other measures conceptually related to externalising behaviours: aggressive impulses ($r = .56, p < .01$) and behavioural functioning within the classroom, as assessed by the BASE-Total ($r = -.46, p < .01$). Conversely, as expected, the scales assessing school and classroom avoidance (YRB-Classroom Avoidance, TRP-School and Classroom Avoidance) demonstrated the strongest and most consistent correlational patterns with unexplained school absences ($r > .29, p < .01$) and lower levels of school attendance overall ($r > -.33, p < .01$).

In terms of the YRB-MTC scales, higher levels of motivation to change were correlated with more positive attitudes to teachers ($r > .17, p < .05$) and intrinsic value

orientation ($r > .18, p < .01$). Attitudes towards teachers is a psychological component of educational engagement or school connectedness (see Table 2.2), and the positive relationship with motivation to change is conceptually supported. Intrinsic value orientation assesses the degree a young person identifies with, considers important or values positive health, relationships, personal growth and community (Kasser & Ryan, 1993). Given that motivation and intrinsic value orientation are both conceptually and empirically related (Ryan & Deci, 2000b), preliminary construct validity is found for the YRB-MTC. Apart from this, and a small number of negative correlations between the YRB-MTC scales and the BASE measures (indicating that lower levels of motivation to change was associated with increased presence of positive behaviour within the classroom), there was a pattern of small to negligible correlations between the YRB-MTC scales and the dependent measures.

In contrast, the TRP-MTC measures (including the Total and sub-factors) demonstrated a more consistent pattern of cross-scale correlations. That is, higher levels of youth-reported motivation to change was associated with increased identification with criminal others ($r > .13$) and aggressive impulses ($r > .15$), lowered levels of satisfaction with life, optimism, self-efficacy and self-esteem ($r > -.07$), poorer behavioural functioning within the classroom (BASE Total; $r > -.18$) and lowered levels of educational risk taking ($r > -.15$). However, for a number of individual scales, the correlation failed to reach statistical significance. The results are consistent with research that supports the positive relationship between motivation to change and the number of behavioural problems and lowered generalised wellbeing (e.g., Shealy et al., 2007; Slesnick, Dashora, et al., 2009).

The YPA measure exhibited no consistent correlational pattern with the youth-report measures conceptually related to offending (identification with criminal others, attitudes to police, aggressive impulses) and wellbeing (optimism, satisfaction with life, wellbeing, self-efficacy and self-esteem, intrinsic value orientation). However, greater levels of problem

awareness were associated with positive behavioural functioning within the classroom (BASE scales; $r > .23$, $p < .01$) and educational risk taking ($r = .38$, $p < .01$). Conversely, higher rates of problem awareness were associated with lower levels of explained ($r = -.16$, $p < .01$) and unexplained absences from school ($r = -.17$, $p < .01$), and increased school attendance ($r = .17$, $p < .01$) across the 2013 reporting period. Given the relationship between prosocial behaviour and higher levels of problem recognition (De Groot & Steg, 2009), preliminary evidence for construct validity is found.

Interestingly, young people who presented with higher levels of motivation to change, as assessed on the TRP-MTC School and Classroom Avoidance subscale, demonstrated a pattern of lower levels of school attendance ($r = -.23$, $p < .01$). Higher levels of motivation to change were associated with a greater number of unexplained absences from school during the 2013 reporting period ($r = .27$, $p < .01$). Both results are consistent with the relationship between motivation to change and problem intensity (e.g., Shealy et al., 2007; Slesnick, Dashora, et al., 2009).

6.3.7 Summary of Psychometric Evidence

This section consolidates the psychometric evidence related to the BCQ (Youth- and Teacher-Report) and the individual sub-factors. This section also reviews the internal validity of the MTC measures, with consideration to the four points raised in Section 6.3.5.3.

- The assessment of behaviours and problems impacting on educational disengagement, as operationalised through the YRB and TRP constructs, remain psychometrically robust. However, the YRB and TRP demonstrate some independence; evidenced by the small to medium inter-scale correlations, and discriminant validity with measures conceptually related to offending, educational engagement and wellbeing.

- The YRB-Total and YRP-Total measures demonstrate consistent correlational patterns (in the expected direction) with constructs conceptually related to offending, wellbeing and educational disengagement. Given evidence of discriminant validity at the factor level, the operationalisation of the YRB and TRP constructs through their latent factors is supported. However, owing to low internal consistency and test-retest properties, the two-item YRB Mental Absence measure requires cautious use and interpretation. The interpretation of the latent factors should also be done in consideration to the possible confounding of individual behaviour within the factor. For instance, it is possible that the presence of a single behaviour within a factor may have either greater or less functional impact, compared to the presence of multiple behaviours being present on a factor. This is further discussed in Section 9.3.2.2.
- Compared to the YRB scales, the YRP scales demonstrate smaller correlational patterns with the other BCQ factors, and with static risk factors and dependent measures within the study. Given the YRB criteria is also fulfilled through the construction of the YRP scales, the YRP scales are not used as outcome variables within the main study. However, as they assess problem awareness in the context of specific behavioural patterns, YRP scale variables are applied as covariates within the propensity score matching models (see Section 7.3.5).
- The YRB-MTC constructs assesses a young person's willingness and motivation to change self-assessed behaviours that are indicative of educational disengagement. Preliminary evidence for construct validity was found. Specifically, young people who value intrinsic needs (e.g., personal growth) and have stronger psychological engagement with school (assessed through attitudes towards teachers) demonstrated higher levels of motivation to change.

Furthermore, at the factor level, there is preliminary evidence of stronger motivation to change being associated with behavioural and educational problems, and lowered wellbeing. However, taken on a whole, the YRB-MTC constructs demonstrate a level of independence from measures conceptually related to offending, educational disengagement and poor wellbeing.

- The TRP-MTC constructs assess a young person's motivation to change behaviours that have been assessed by a teacher as representing a "problem". The review found strong evidence for construct validity, with stronger motivation to change associated with behaviours conceptually related to increased offending and educational engagement, and lower levels of wellbeing (e.g., satisfaction with life, self-esteem). This is consistent with literature where higher levels of motivation to change are associated with problem severity, as operationalised through higher levels of stress, and emotional or behavioural symptoms (see Section 4.5.1.6).
- Collectively, the YRB-MTC and TRP-MTC measures demonstrate different patterns of construct validity. While both constructs are strongly correlated, their independence appears a function of their content focus: "youth assessed behaviour" for the YRB-MTC and "teacher-report problems" for the TRP-MTC.
- An unanswered question from this chapter is whether or not individual behaviours or problems within the MTC factor subscales demonstrate variability in respect to motivation to change. Chapter 4 suggests that motivation to change demonstrates variability across behavioural type (e.g., intrapersonal versus interpersonal). It was beyond the scope of this research to conduct a more detailed analysis of within-factor moderators of motivation to change. Given this, it is possible that behavioural type and motivation to change are confounded

within the MTC sub-factors. The motivation to change measures developed in this research therefore represent “generalised” measures of motivation to change. Motivation and behavioural type are likely to be strongly confounded in the YRB-MTC and TRP-MTC Total measures, and therefore these measures require cautious use and interpretation.

- YPA was a composite scale developed from both the youth- and teacher-report BCQ. While the measure demonstrated no empirical relationship with youth-reported constructs conceptually related to offending or wellbeing, construct validity was evidenced through measures assessing educational disengagement (e.g., behaviour in classroom, attendance and behavioural data provided by DECD). Its inclusion within the main study is therefore justified.

6.4 Chapter Summary

The BCQ (Youth- and Teacher-Report) was designed to operationalise and assess the process and outcome of change specific to behaviours that impact on educational engagement within mainstream school settings. This chapter has described the significant challenges that exist in developing a tool that assesses motivation to change for a multidimensional construct like educational engagement, and where an independent assessment of “problems” is required. This chapter concludes that the BCQ can reliably assess behaviours indicative of educational disengagement, or in other words, assess the “outcome” of possible change. The use of BCQ to assess change as a “process”, or the motivational constructs underpinning change, remains supported at the factor level. Given the potential confound between motivation and behavioural type, the BCQ’s assessment of motivation to change, as operationalised through “youth reported behaviour” (YRB-MTC) and “teacher-reported problems” (TRP-MTC) is best described as a “generalised” assessment. Despite this, given that the BCQ represents the first systematic attempt to assess motivation to change across

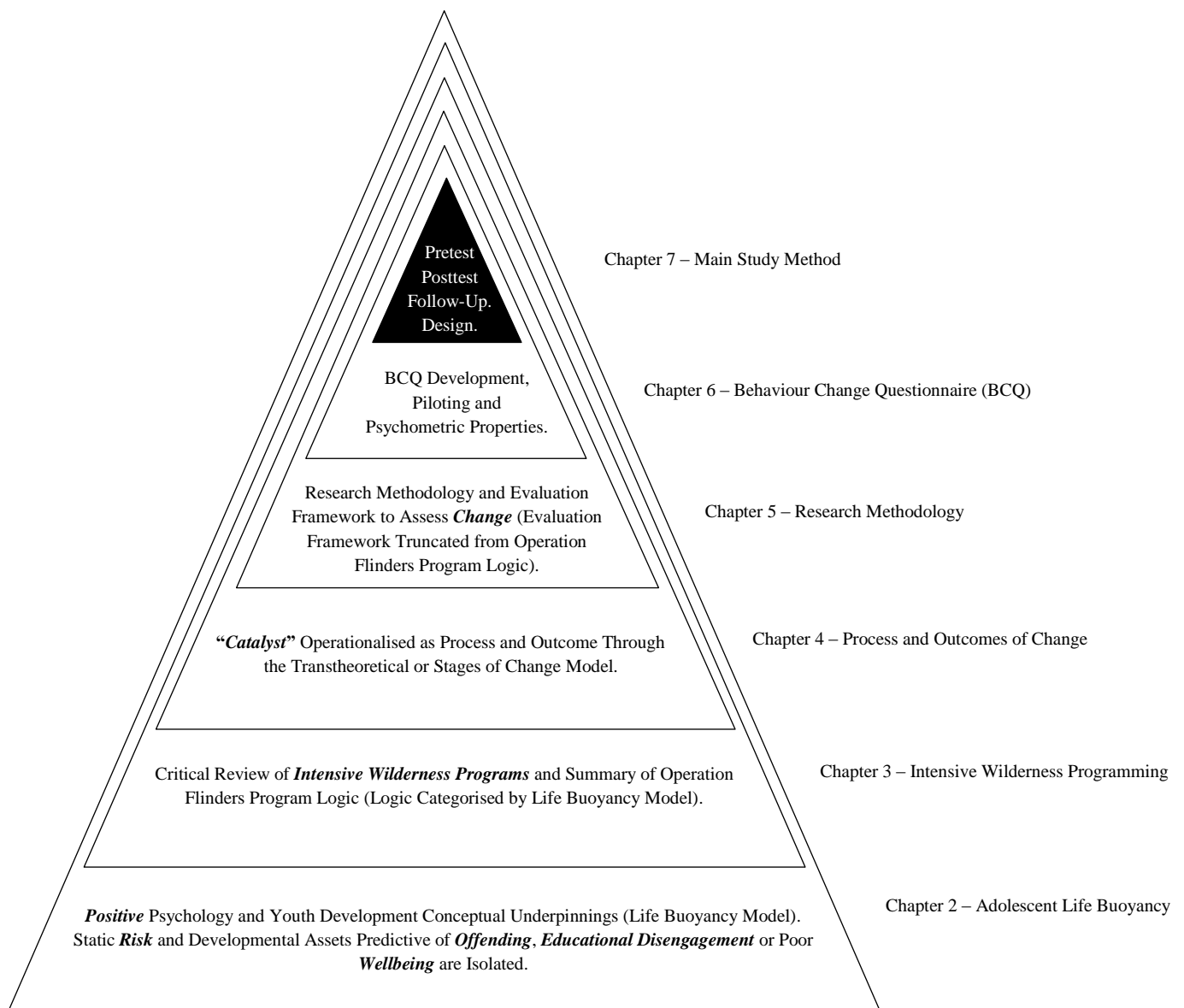
mainstream educational settings, its continued use within this thesis is supported.

Commentary on the internal and external validity of the BCQ, including directions for further psychometric assessment and refinement, is provided in Chapter 9.

Chapter 7

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
Chapter 9 – Discussion
Chapter 10 - Conclusions



7 Main Study Method

This chapter provides the method for the main and follow-up studies, including the procedure and instruments specific to the assessment of offending, educational engagement and wellbeing outcomes, and the static risk factors articulated in the evaluation framework (Table 5.1). The psychometric properties of all instruments and the descriptive properties of the control and treatment participants are also detailed. The chapter summarises the data management processes, the statistical methods applied to match the Operation Flinders and control group members, and the rationale for the employment of the statistical analyses (regression-based analyses and effect size reporting) used to answer the research question.

7.1 Procedure

This section details the participant and stakeholder engagement strategy, and the procedure specific to the pre-program, within-program, post-program and follow-up data collection points.

7.1.1 Participant and Stakeholder Engagement

In the preparation stages of the main study, approximately 400 treatment and 200 control young people (originating from 60 schools and referring agencies) were identified as potential study participants. Approximately 100 teachers were sought to act as informants to provide pre- and post-program behavioural observations. A comprehensive engagement strategy was enacted comprised of the following features. First, the entire project was marketed within a strength-based and positive psychology framework (referred to within the public correspondence as “adolescent life buoyancy”). That is, all correspondence provided to schools, guardians, teachers and participants was framed in a positive way that focused on youth wellbeing, resilience and positive educational engagement. The researcher was

concerned that if the project was marketed with forensic (or deficit-based) overtones it would evoke stigma that would negatively influence participant engagement. Young people (and their guardians) recruited to the main study as control participants received information sheets indicating that they were part of a study assessing “adolescent life buoyancy”.

Second, all young people who participated in the project were remunerated with a \$15.00 voucher from a major department store or local shop in the case of rural communities. Feedback provided to the researcher by school personnel indicated that the \$15.00 voucher had a significant role in aiding the recruitment of young people into the study, and reducing participant attrition.

Third, a public website (www.lifebuoyancy.org) was developed to support schools, teachers, families and participants to build confidence and trust in the project. The website promoted the strength-based focus of the research, and detailed information related to the evaluation was provided on this site.

7.1.2 Pre-Program Procedure

In early 2013, all referral agencies participating in a 2013 Operation Flinders program received an introductory letter from Operation Flinders leadership requesting their support in the evaluation. Approximately 8-10 weeks before the start of each of the five program waves (March, May, June, August and September), the researcher initiated phone and email contact with a key contact person from the referral agency. This contact introduced the nature of the evaluation, the role of the control group and the assistance sought. The researcher sought to identify a key liaison person who could work alongside the researcher in the local administration of the evaluation. Consent was obtained from the agency manager or school principal. All information sheets and consent forms were posted to the agency for dissemination.

The key liaison person took responsibility for the recruitment and assignment of young people to both the participant and control groups. This individual was responsible for selecting a group of young people to participate in the program. As anticipated, referral agencies identified young people to attend the Operation Flinders program on the basis of their individual interpretation of the selection criteria and to ensure appropriate group dynamics. To establish the control group, the key liaison person was asked to “identify young people who would have participated in the program if there were double the number of places available”. In many cases, referral agencies indicated to the researcher that they had already identified a large pool of potential candidates to attend the Operation Flinders program, with the view of managing expected attrition in the lead-up to program attendance. In these cases, the researcher suggested that all young people in the pool be approached and requested to enter the study. It is noted that the process to select participants and controls introduces a range of potential biases. Notably, students with the greatest need are likely to be selected to attend the program and, consequently, control group members are likely to present with lower risk profiles.

Approximately 2-3 weeks before the start of the individual program, the researcher posted all questionnaire material, additional participant information sheets and consent forms, and protocols for the administration of the questionnaires to the key liaison person. All material was colour-coded for ease of administration. A detailed written protocol for the reliable, valid and ethical administration and management of questionnaire material was provided to each key liaison person (see Appendix U).

Two weeks before the start of each program, the researcher attended an information exchange meeting attended by school, referral and Operation Flinders representatives. During this meeting, the researcher reviewed the referral agency’s implementation of the evaluation, and reinforced the protocols for questionnaire administration. Information sheets

and consent forms were provided to Operation Flinders program facilitators. Where facilitators were not able to attend this session, the researcher individually introduced the research and the consent processes by email, with follow-up phone contact. All communication, including the Information Sheet (see Appendix M), emphasised that Operation Flinders facilitator or group performance was not being assessed through the evaluation.

The referral agency key liaison person was requested to ensure that youth- and teacher-report questionnaires were completed in the week prior to the start of the Operation Flinders program, and if this date was not practical, the nearest day before or after this date was acceptable. In a small number of cases, questionnaires were completed by teachers and control group participants during the week participants attended the intervention, and youth-report questionnaires were completed by Operation Flinders participants on route to the Operation Flinders exercise area by bus. In respect to the latter, given the Operation Flinders program formally started when participants reached the program area, these questionnaires were accepted within the evaluation.

Throughout the pre-program implementation, the researcher implemented a communication plan with each key liaison person. The researcher maintained weekly email and/or phone contact to provide external support to: (1) the dissemination and collation of consent forms; (2) the identification of suitable key observers (school teachers) to complete the observational measures; (3) the recruitment of participants to the study; and (4) monitor the valid and reliable completion of the questionnaire material.

Questionnaire material was returned in a supplied pre-paid envelope or during face-to-face contact between the key liaison person and the researcher during the Operation Flinders program.

7.1.3 Within-Program Procedure

The Operation Flinders program facilitator (titled team leader) responsible for the individual intervention group was requested to complete a three-page observational questionnaire on each young person at the half way point of the intervention (day 4) and at program conclusion (day 8). The same paper questionnaire was used at both times. In the majority of cases, the assigned program facilitator completed the questionnaire with feedback and collaboration from other adult facilitators. The researcher met with the Operation Flinders team leader on day 7 (in the field) and clarified the questionnaire completion protocols. The completed questionnaires were hand delivered to the researcher following program completion, or returned by stamped, self-addressed envelope. In a small number of cases, the day 8 observational questionnaire was completed in the week following the completion of the Operation Flinders intervention.

7.1.4 Post-Program Procedure

Communication was initiated between the researcher and the key liaison person approximately three weeks after the finish of the Operation Flinders program. On the fifth week anniversary of the completion of the program, the researcher posted all questionnaire material, gift vouchers and protocols for the administration of the posttest questionnaires. All material was colour-coded for ease of administration. A detailed written protocol for the reliable, valid and ethical administration and management of questionnaire material was provided to each key liaison person (see Appendix U).

The key liaison person was requested to ensure that questionnaires were completed in the sixth week following the completion of the Operation Flinders program, and if this date was not practical, the nearest day after this date was acceptable. The posttest questionnaire completion timings were constrained by school holiday periods and, on a number of

occasions, youth- and teacher-report questionnaires were not completed until the 8-9 week anniversary of the completion of the Operation Flinders program.

Questionnaire material was returned in supplied pre-paid envelopes.

7.1.5 Follow-Up Procedure

During the post-program phase, each participant's referring agency was requested to provide the unique student identification number (ED-ID) pertaining to all participants originating from a South Australian government school referral source. Twelve months after the completion of the five Operation Flinders interventions, a formal request was made to the South Australian Department of Education and Child Development (DECD) to access historical school attendance, behaviour and achievement data related to participants where ED-ID numbers had been provided. In this thesis, this data collection is referred to as the follow-up study.

A phone meeting was scheduled with a representative of the DECD Data Analysis Unit to negotiate the requested attendance, achievement and behavioural data. Centrally validated attendance data, assessed as reliable and valid for research use by the DECD Data Analysis Unit, was only available for school Terms 1 and 2 (corresponding to the half-year period January to June). Similarly, centrally validated behavioural data was only available for the school Term 2 (corresponding to the period April to June). Given that it was not possible to access pre- and post-program behavioural and attendance data (matched to the intervention period), full sets of validated data for the years 2013 and 2014 were requested and provided. The date a young person was no longer enrolled in a DECD school and when enrolment was switched to an off-site flexible learning option program (titled FLO enrolment) was also provided. FLO enrolled students receive higher levels of support and have access to alternative (sometimes off-school site) learning pathways. These students are likely to present

with higher levels of need that are not able to be accommodated within mainstream school settings.

The research also sought educational achievement data (a static risk predictor specified on the evaluation framework, Table 5.1). In Australia, all students undertake the National Assessment Program - Literacy and Numeracy (NAPLAN), a standardised achievement test in school Years 3, 5, 7 and 9. NAPLAN assesses the domains of reading, numeracy, spelling, writing and language conventions. Standardised score and proficiency band data were provided on all five NAPLAN outcome measures related to the most recent assessment year. The standardised score is such that any given score represents the same level of achievement over time. For example, a score of 700 in reading will have the same meaning for a student in Year 7 and Year 9. The scale for each domain is divided into ten bands to cover the full range of student achievement in the tests. The bands map the increasing complexity of the skills assessed by NAPLAN. Only the standardised scores were applied (see Section 7.3.5, propensity score matching) and reported within this thesis.

Table 7.1 summarises the variables, definitions and coding responses specific to the data provided by the Department of Education and Child Development (DECD). The following variables were used as outcome variables within the evaluation: (1) School Attendance Rate, (2) School Unexplained Absences, (3) School Explained Absences, (4) Left School within 12 Months and (5) School Suspension/Exclusion (DECD).

Table 7.1

Variables, Definitions and Coding Responses for DECD Electronic Data

Domain	Variable name	Definition	Coding responses
Attendance	School attendance rate ^a	The number of days a young person attended school, as a proportion of the total number of possible school days.	% (or proportion)
	School unexplained absences ^a	The number of days a young person did not attend school and where this attendance <u>was not</u> explained or accounted for by the reporting school.	Frequency (days)
	School explained absences ^a	The number of days a young person did not attend school and where this attendance <u>was</u> explained or accounted for by the reporting school.	Frequency (days)
Behavioural	Date of behavioural problem ^d	The date of a student behavioural problem that met the school's threshold for electronic data recording.	Date
	Coding of behavioural problem ^d	Behavioural problems were coded categorically and include: safety or wellbeing; threatened good order; interfered with rights of others; violence threatened or action; acted illegally; persistent and wilful inattention.	
	School suspension or exclusion (DECD) ^b	School outcome of behavioural problem: coded as suspension or exclusion.	Dichotomous; 0 = no suspension or exclusion, 1 = one or more suspension or exclusion
	Outcome length ^d	Number of days of suspension or exclusion.	Frequency (days)
	Left school within 12 months ^e	Date a young person was no longer enrolled in a DECD school.	Recoded dichotomous; 0 = enrolled at 12 month post-program anniversary, 1 = no longer enrolled at 12 month post-program anniversary.
Achievement	Year of NAPLAN test ^d	Year the NAPLAN test was most recently completed.	Year
	Reading ^c	Achievement level specific to reading English.	Standard score and proficiency band
	Writing ^c	Achievement level specific to writing English.	Standard score and proficiency band
	Spelling ^c	Achievement level specific to spelling English.	Standard score and proficiency band
	Numeracy ^c	Achievement level specific to numeracy (arithmetic or mathematics).	Standard score and proficiency band
	Language conventions ^c	Achievement level specific to spelling, grammar and punctuation.	Standard score and proficiency band

Note: ^aThese variables were applied as pretest-posttest outcome variables. ^bThis variable was applied as a pretest-posttest outcome variable and should not be confused with the youth-report variables tapping similar constructs: “pre-program suspension” or “pre-program exclusion”. These later variables were only applied in the research for the purpose of matching Operation Flinders and control group participants. ^cStandardised NAPLAN scores were used in the research for the purpose of matching control and Operation Flinders participants (see Step 5, Figure 7.2, propensity score matching). ^dData provided by DECD but not applied within the research. ^eApplied only as a posttest outcome variable within the research.

7.1.6 Implementation Challenges and Inconsistencies

There are many unique challenges in conducting large scale field research (Eisner et al., 2011), particularly studies (as in the current research) occurring over multiple sites, where significant attention has to be paid to implementation quality and consistency to manage threats to internal validity (Taxman & Rhodes, 2010). As noted within this chapter (and discussed in Section 5.3), the research paid significant attention to stakeholder engagement and communication. Despite the researcher employing a targeted communication strategy that included weekly email, written, phone or face-to-face contact, there were moderate levels of variability noted in the research implementation. To illustrate:

- Feedback obtained from key liaison personnel indicated that the Operation Flinders selection criteria were interpreted differently across referral agencies. For example, some referral agencies brought a greater focus to low self-esteem as a referral criterion, while other agencies brought greater attention to at-risk or oppositional behavioural patterns.
- The researcher had low visibility and control over the research implementation and there was evidence of the key liaison person not always following (or reading) the research implementation protocols.
- There was evidence of instruments being completed inconsistently across the research sites, for instance on school buses, the school yard, or in a classroom.
- Across a number of sites, there was evidence of convenience sampling for both the Operation Flinders and control group participants. Participant intake for the Operation Flinders program is time-dependent (e.g., a group of 10 participants need to be selected and prepared at a pre-determined point in time). There was evidence of participants attending the program on the basis of availability (or convenience), as opposed to presenting with clear risk factors. There was also

evidence of control group members being recruited to participate in the research on the basis of convenience.

Collectively, these are likely to have introduced a range of sampling biases which poses a threat to study's internal and external validity (Campbell & Stanley, 1963; McKnight et al., 2007). While this remains a notable limitation of the research, there is also a strong argument that the use of propensity score matching (see Section 7.3.5) prior to the outcome analyses being undertaken has somewhat mitigated this threat. This point is discussed further in Section 7.3.5 and Chapter 9 (Discussion).

The researcher's communication with key liaison personnel also raised the point of intervention dosage, primarily, at what point is the start time of the intervention. That is, does the intervention start at the point when youth enter the wilderness program location, or does it start earlier? A number of referral agency personnel indicated that they started to prepare young people for the program weeks and sometimes months ahead of time. In other words, the intervention or "treatment" was not consistently applied between participants. In short, it is possible that for some program participants the pretest was not associated with the true baseline in terms of attitudes and behavioural functioning (see Section 3.5.2). Given the conditions to assess program fidelity (and program variation) were not present, program variations were not able to be assessed nor tracked in the evaluation. This point is further discussed in Chapter 9.

7.2 Instruments

The evaluation employed a range of measures assessing all static risk predictors and outcome variables captured in the evaluation framework (Table 5.1). This was implemented through three separate questionnaires: (1) a youth-report questionnaire completed by Operation Flinders and control group participants in the pre- and post-program phases, (2), a teacher-report questionnaire completed in the pre- and post-program phases on Operation

Flinders and control group participants and (3) an observer-report questionnaire completed by Operation Flinders facilitators on Operation Flinders participants only. Consent was also provided for the researcher to access background referral information on all participants referred to the five waves of the Operation Flinders program. All assessment instruments and timings are summarised in Figure 7.1.

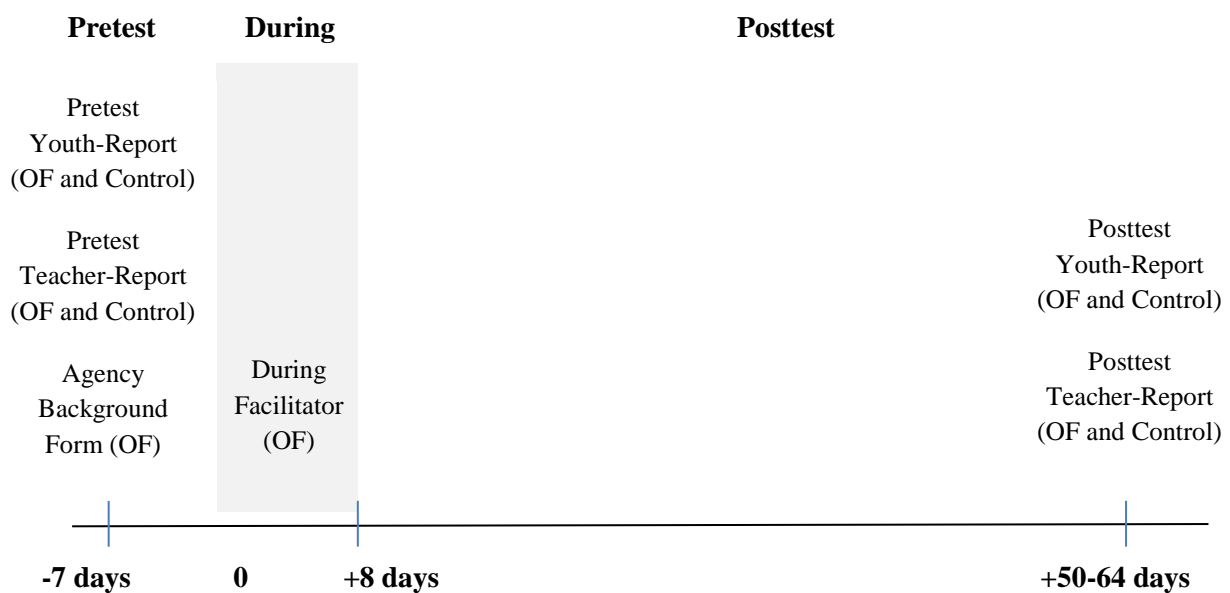


Figure 7.1 Summary of assessment questionnaires and completion timings for Operation Flinders (OF) and control group participants

7.2.1 Youth-Report (Pretest and Posttest)

Operation Flinders and control group participants completed a six-page pretest posttest questionnaire. The posttest questionnaire was marginally shorter as a number of static risk predictor variables were omitted (age, sex, year level, sleep length, race, and exclusion, suspension and conviction history). The youth-report questionnaires were designed to accommodate anticipated literacy and attention span difficulties and assess a broad range of outcomes conceptually and empirically related to future offending (see Table

2.1), educational engagement (see Table 2.2), and wellbeing (see Table 2.3). The length of the questionnaire was restricted to six pages following expert feedback, previous research with a similar cohort (Raymond, 2003) and researcher observations of participant attention within the pilot study (as reported in Chapter 6).

In addition to assessing a range of background variables (e.g., age, sex, race, school year level), the youth-report questionnaire included the following static risk predictors and outcome measures. The pretest and posttest youth-report questionnaires are provided in Appendix P and R, respectively.

7.2.1.1 *Living arrangements*

Young people from divorced or separated families (Amato & Keith, 1991), or young people with unstable living arrangements (Edidin, Ganim, Hunter, & Karnik, 2012), are at higher risk of negative future outcomes. To operationalise this construct, participants were asked to respond to the question: “Over the past week, with whom or where have you spent the majority of nights living? (circle one)”. The following responses were offered: “one parent”, “both parents”, “other family member (e.g., aunt, uncle)”, “friends”, “couch surfing”, “girlfriend/boyfriend” or “other”. This was provided in the pretest questionnaire only. The item was constructed using similar constructs and items from the Longitudinal Surveys of Australian Youth (NCVER, 2013). The item was dichotomously recoded with “1” indicating that participants resided with both parents at the start of the program, while “0” represented the other five options. This recoded variable was labelled: “living both parents” and operationalises the static risk variable “single parent household” on the evaluation framework (Table 5.1).

7.2.1.2 *Sleep Length*

Sleep patterns have a strong predictive relationship with wellbeing (Fuligni & Hardway, 2006) and educational achievement (Curcio, Ferrara, & De Gennaro, 2006)

outcomes. In the pretest only, participants were asked to respond to the question: “On average, over the past week, how many hours sleep have you had per night?”, with space for an open-ended response provided.

7.2.1.3 Family Support

The level and type of family support has an important predictive relationship with school engagement (Huston & Bentley, 2010), wellbeing (Chu, Saucier, & Hafner, 2010; Pinkerton & Dolan, 2007) and prosocial behaviour (Hoge et al., 1996). Participants were asked to respond to the question: “How much support does your family provide to you?” with one of four selection choices: “no support at all”, “occasional support”, “regular support” and “they are always there for me”. The item was constructed using similar constructs and items from the Longitudinal Surveys of Australian Youth (NCVER, 2013).

7.2.1.4 Historical Behavioural Problems

Historical offending and behavioural problems are important predictors of future negative behavioural patterns (Andrews & Bonta, 2010a; Cottle et al., 2001). In the pretest questionnaire only, participants were asked to respond to the following questions. The content and wording of the items were adapted from a previous study by Raymond (2003).

- *School Suspension* – “How many times have you been suspended from school?”

Responses were provided on a 6-point continuum as follows:

0 1 2 3 4 5+

- *School Exclusion* – “How many times have you been excluded from school?”

Responses were provided on a 6-point continuum as follows:

0 1 2 3 4 5+

- *Criminal Conviction* – “How many times have you been convicted of committing an offence?” Responses were provided on a 6-point continuum as follows: 0 1 2 3 4 5+

Given all three variables’ frequency distribution was highly positively skewed, the items were recoded dichotomously, with “0” representing no historical problem and “1” indicating one or more reported problems. These variables were labelled as “pre-program criminal conviction”, “pre-program suspension” and “pre-program exclusion”.

7.2.1.5 *Recent Behavioural Problems*

Recent offending, oppositional and conduct related behaviours are strong predictors of future behavioural problems (Andrews & Bonta, 2010a). They are particularly important in this research as they represent the most accurate assessment of behavioural risk at the time of intervention. Conversely, suspension, exclusion and conviction data are historical markers, that, while having predictive validity (Andrews & Bonta, 2010a), may not fully assess the dynamic and changing nature of risk present at the time of intervention. A brief measure of recent truancy, alcohol consumption and offending behaviour was completed by participants at both the pretest and posttest. Participants were asked to respond to the following questions. The content and wording of the items were adapted from a previous study by Raymond (2003).

- *Truancy* (frequency) – “How many times have you wagged school in the past month?” Responses were provided on a 6-point continuum as follows:
0 1 2 3 4-9 10+
- *Offending* (frequency) – “How many times have you broken the law in the past month?” Responses were provided on a 6-point continuum as follows:
0 1 2 3 4 5+

- *Alcohol consumption* (frequency) – “How many separate occasions have you consumed alcohol in the past month?” Responses were provided on a 6-point continuum as follows: 0 1 2 3 4 5+

These three variables were applied as pretest-posttest outcome measures within the research, and labelled “truancy frequency”, “offending frequency” and “alcohol consumption frequency”.

All three variables, for the pretest measure only, were dichotomously recoded with “1” indicating that the behaviour was present on one or more occasion and “0” indicating the behaviour was not present. The variables were labelled as “pre-program offending”, “pre-program alcohol consumption” and “pre-program truancy”, and applied as predictor variables within the propensity score matching models (see section 7.3.5). These dichotomous variables were not applied as pretest-posttest outcome measures owing to the large number of dependent variables in the research.

7.2.1.6 Aspirations for Future

Aspirations for future remains an important predictor of future vocational and educational engagement (Nguyen & Blomberg, 2014) and wellbeing outcomes (Ryan et al., 1999). Aspirations were operationalised through the following items which were constructed with reference to similar constructs and items from the Longitudinal Surveys of Australian Youth (NCVER, 2013).

- “When would you like to leave school?” - Participants were asked to select one of the following responses: “as soon as I can”, “at the end of year 9”, “at the end of year 10”, “at the end of year 11” and “at the end of year 12¹⁶”. This item was dichotomously recoded with “1” representative of young people aspiring to

¹⁶ Year 12 is the final year of Australian high school education.

complete year 12, and the remaining four responses recoded as “0”. This recoded variable was labelled “aspire to complete year 12”.

- “What would you like to do after you leave school?” - Participants were asked to select one of the following responses: “go to university”, “go to TAFE”, “get a job”, “go on the dole” and “start a family”, “something else” and “don’t care”.¹⁷
- “Where do you see yourself in 12 months?” - Participants were asked to select one of the following responses: “at school”, “studying at TAFE or university”, “doing an apprenticeship”, “working”, “on the dole”, and “don’t care”.¹⁸

7.2.1.7 Identification with Criminal Others

The identification with criminal others is a dynamic risk factor (or criminogenic need) predictive of future offending (Andrews & Bonta, 2010a). Its inclusion within the evaluation of youth crime prevention programs is supported within the criminological literature (Day, 2005), and was also included to meet funder reporting needs (see Section 5.2.4). A five-item measure, employing a five-point Likert scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”, was used to assess a participant’s identification with criminal others. This scale was previously developed by Mohr et al. (2001) from a modified version of the Criminal Sentiments Scale (CSS; Andrews & Wormith, 1984), with the reference to the CSS subscale: Identification with Criminal Others. Mohr et al. modified the CSS item wording to a youth at risk sample with consideration to the “simplification of structure and wording of items, elimination of ambiguous or complex terms or items” (p. 76). Scale items included: “I have much in common with people who break the law”, “I look up to people who break the law” and “I would rather mix with people who obey the law than those who don’t”.

¹⁷ This item demonstrated low response variability, with a high proportion of young people choosing the “university” or “TAFE” options. For this reason, this item was not used to operationalise aspirations within the study.

¹⁸ This item demonstrated low response variability, with a high proportion of young people choosing the option “at-school”. For this reason, this item was not used to operationalise aspirations within the study.

The measure included two negatively worded items. Both Mohr et al. (2001) and Raymond (2003) reported that the scale exhibited an acceptable level of internal consistency. Higher scores represent an increased identification with criminal others.

7.2.1.8 Attitudes to Police

Negative attitudes to police is a dynamic risk factor (or criminogenic need) predictive of future offending (Andrews & Bonta, 2010a). A seven-item measure, employing a 5-point Likert scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”, was employed to assess a participant’s attitudes to police. This scale was developed by Mohr et al. (2001) from a modified and simplified version of the CSS (see previous point) subscale “Attitudes to Police” (Andrews & Wormith, 1984). Scale items included: “life would be better without police”, “a cop is a friend to people in need” and “there should be more police”. The measure included three negatively worded items. Both Mohr et al. and Raymond (2003) reported that the scale exhibited good internal consistency. Higher scores represent more positive attitudes to police.

7.2.1.9 Attitudes to Teachers

Attitudes to school and teachers is predictive of future educational outcomes (Connolly, McMaster, & Hatchette, 1999) and represent a psychological dimension of educational engagement (e.g., Appleton et al., 2006). A seven-item measure, employing a five-point Likert scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”, was employed to assess a participant’s attitudes to teachers. Previously validated scales were assessed for their suitability to be included within the research, however, they were not deemed appropriate or sensitive for a youth at-risk cohort. The scale items were developed by the researcher (reviewed by expert panel members) with consideration to the Attitudes to Police measure (see above) which was used as a reference point for item wording and construction. Scale items included: “life would be better without teachers”, “teachers are

just in it for themselves” and “teachers don’t try to help students”. The measure included three negatively worded items. Higher scores represent more positive attitudes to teachers.

7.2.1.10 Anger Regulation (Aggressive Impulses)

Emotional regulation problems (expressed as aggression) are a dynamic risk factor predictive of future offending (Andrews & Bonta, 2010a), educational disengagement (Graziano et al., 2007) and lowered satisfaction with life (Gilman & Huebner, 2006). Its inclusion within program evaluations is supported within the criminological literature (Day, 2005). An eight-item subscale, employing a five-point Likert scale, with 1 representing “never” and 5 representing “very often”, was employed to assess a participant’s recent experience of aggressive impulses (anger expressed outwardly). Participants were asked to think back over the past week and indicate how often the aggressive impulses had occurred. Scale items included: “I yelled at someone”, “I threatened someone” and “I blew my top”. All items were coded in the same direction. This scale had been developed by Mohr et al. (2001) and used by Raymond (2003) with evidence of good internal consistency and convergent validity with observational measures of aggression. Higher scores represent increased outward expression of anger, and within the research the variable is labelled “aggressive impulses”.

7.2.1.11 Behaviour Change Questionnaire (Youth-Report)

The Behaviour Change Questionnaire (BCQ, Youth-Report) assessed the presence of behaviours indicative of school disengagement (YRB), and an individual’s willingness and motivation to address behavioural problems (MTC). A matched observer-version of this questionnaire was also administered. A detailed overview of the construction, piloting and psychometric properties of the BCQ can be found in Chapter 6.

7.2.1.12 Aspiration Index – Intrinsic and Extrinsic Value Orientation

Values are an important dynamic risk factor predictive of future offending (Andrews & Bonta, 2010a), wellbeing (Ryan & Deci, 2000b) and educational achievement (Eccles & Wigfield, 2002). In an exploratory evaluation, Raymond and Lappin (2011) found that intensive wilderness programs may strengthen values related to family, community and personal health and wellbeing. The Aspiration Index, developed by Kasser and Ryan (1993), was identified as a suitable tool that operationalised these intrinsic values. A 21-item modified version of this scale was employed to assess a participant's aspiration to either intrinsic or extrinsic values. The original scale was comprised of seven categories (three items per category) tapping extrinsic aspirations of wealth ("you are rich"), fame ("you are famous") and image ("people say you are attractive"); and intrinsic aspirations of meaningful personal relationships ("you have good friends"), personal growth ("you like yourself as you are") and community contribution ("you do things for the community"). The original scale included three items tapping the category of good health (e.g., "you are very fit"). These items had not been found to load on either intrinsic or extrinsic value orientation (Kasser & Ryan, 1993). Participants were asked to review the 21 aspirations and "then circle the number that best indicates how important it is that the event happens to you". Responses were provided on a five-point scale, with 1 representing "not at all" and 5 representing "the most important".

7.2.1.13 Satisfaction with Life

Satisfaction with life is a construct that has been widely used to operationalise subjective wellbeing (see Chapter 2 and Diener, 2000). Participants completed the Satisfaction with Life Scale – Children (SWLS-C). This five-item scale was adapted from the Satisfaction with Life Scale (SWLS; Diener et al., 1985); a widely used and validated measure to assess subjective life satisfaction in adults (Pavot & Diener, 2008). This SWLS-C

employed a five-point Likert scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”. Scale items included: “The things in my life are excellent”, “I am happy with my life” and “If I could live my life over, I would have it the same way”. All items were positively coded, and higher scores represent increased satisfaction with life. This scale had been found to demonstrate sound psychometric properties for children (M = 11 years) (Gadermann, 2009; Gadermann et al., 2010).

7.2.1.14 Self-Esteem

Self-esteem is a construct widely applied within the wellbeing literature (Ryan & Deci, 2001), and can be defined as a young person’s perception or belief about their worth (Rosenberg, 1965). A five-item self-report measure was completed by both the control and participant groups (pretest and posttest). Mohr et al. developed this measure with consideration to existing measures of self-esteem, including the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and Coopersmith Self-Esteem Inventory (Coopersmith, 1967). The scale had previously demonstrated a moderate level of internal consistency ($\alpha = .75$) (Mohr et al., 2001). On a five-point Likert scale, with 1 representing “strongly disagree” and 5 representing “strongly agree”, respondents indicated their agreement with how each item represented how they currently felt. Scale items included: “I feel useless at times”, “I’m pretty happy with myself” and “I have a low opinion of myself”. Two of the items were negatively worded, and higher scores represent increased self-esteem.

7.2.1.15 Optimism

Optimism is a measure of an individual’s hopefulness or confidence in the future and is a strong predictor of future health (Rasmussen, Scheier, & Greenhouse, 2009), positive coping (Nes & Segerstrom, 2006) and achievement outcomes (Carver et al., 2010). A three-item optimism measure was adapted from the Youth Life Orientation Test (Ey et al., 2005). On a five-point Likert scale, with 1 representing “strongly disagree” and 5 representing

“strongly agree”, respondents indicated their agreement with each item. The scale included two positively (“I can see good things happening to me in the future”, “Overall, I expect more good things will happen to me than bad”) and one negatively worded item (“things always go wrong for me”). Higher scores represent higher levels of optimism.

7.2.1.16 Self-Efficacy

Self-efficacy is a construct that taps an individual’s belief or perceptions to positively influence future outcomes, and it is strongly predictive of wellbeing (Massey et al., 2009), future achievement outcomes (Bandura et al., 2001) and prosocial goal setting (Carroll et al., 2013). The construct has been traditionally operationalised in respect to individual behavioural domains (de Cassia Martinelli, Bartholomeu, Gakyia Caliatto, & de Grecci Sassi, 2008). For example, individuals express self-efficacy differently across social, work or educational domains. That is, an individual may have high levels of self-efficacy for educational achievement, but demonstrate lower levels of self-efficacy within social settings. Given the heterogeneous nature of the participant group, originating from multiple referral sources and contexts, the operationalisation of self-efficacy across multiple behavioural domains (e.g., education, social) was contraindicated. For this reason, a generalised measure of self-efficacy was applied. While the psychometric properties and applied utility of generalised measures of self-efficacy are questioned (Lennings, 1994), given that self-efficacy is one of the most consistent reported outcomes of wilderness programs (Wilson & Lipsey, 2000), its inclusion within the research was warranted. A four-item measure was developed from items from the Generalised Self-Efficacy Scale (Tipton & Worthington, 1984). Scale items included: “I give up easily” (negatively worded), “I am a very determined person”, “when I set important goals for myself, I achieve them” and “I can succeed at almost anything I set my mind to”. Higher scores represent increased generalised self-efficacy.

7.2.2 Teacher Report (Pretest and Posttest)

A two-page observational questionnaire was completed by teachers related to Operation Flinders and control participants prior to and following the Operation Flinders program (Appendix L). This questionnaire included the following three measures.

7.2.2.1 Behaviour Change Questionnaire (BCQ Teacher-Report)

The BCQ assessed the presence of behaviours indicative of school disengagement, and an individual's motivation to address behavioural problems. A matched youth-report version of the BCQ was also included within the research, and a detailed overview of the construction, piloting and psychometric properties of the BCQ can be found in Chapter 6.

7.2.2.2 Behavioral Academic Self-Esteem (BASE)

Developed by Coopersmith and Gilberts (1982), the 16-item BASE provides a measure of self-confidence, coping ability and self-esteem within the classroom setting, and was applied to operationalise the skill outcome of “adaptive school and classroom behaviour” as articulated on the evaluation framework (Table 5.1). The original measure was slightly modified for the study in two ways. First, for each item, the noun “child” was replaced with “young person”. Second, following review from a member of the expert panel, two of the original items were modified to match the youth-at-risk participant group, and reflect prosocial behavioural outcomes. That is, the item “the child’s company is sought by peers” was replaced with “the young person’s company is sought by prosocial peers”, and the item “this child readily expresses opinions” was replaced with the wording “this young person readily expresses opinions in an appropriate manner”.

Responses were provided on a five-point Likert scale, with 1 representing “never” and 5 representing “always”. The five BASE subscales include:

- *Student Initiative* – six-item subscale designed to measure a student’s willingness and initiative to engage in a range of classroom activities.

- *Social Attention* – three-item subscale designed to measure a student’s cooperation and willingness to engage in behaviours associated with classroom learning.
- *Success-Failure* – two-item subscale designed to measure a student’s ability to cope with his/her mistakes and teacher feedback.
- *Social Attraction* – two-item subscale designed to measure a student’s social attractiveness, or willingness to interact with his/her peers.
- *Self-Confidence* – two-item subscale designed to measure a student’s willingness to express opinions and appreciate the products of his/her work.

In previous evaluations, conducted with similar participant cohorts (Mohr et al., 2001; Raymond; 2003), the composite or total BASE score was found to exhibit excellent internal consistency. While the individual subscales’ internal consistency demonstrated greater variability, Mohr et al. and Raymond reported that they ranged from the good to excellent range. All items were worded in the positive direction, and higher scores represent increased self-esteem as behaviourally expressed within the classroom environment.

7.2.2.3 Educational Risk Taking

The research sought to assess changes in a young person’s willingness to engage in unfamiliar educational tasks. Given the relatively short pretest and posttest assessment period, validated achievement-based educational measures were assessed as lacking the sensitivity to be used as outcome measures. A brief screening observational measure of academic performance was constructed, with item content and wording modified through feedback and review from child psychology and educational experts. All items were constructed with high face validity as they loaded on the construct of educational risk taking, defined as a young people’s willingness to participate in novel or unfamiliar educational tasks

in classroom settings. Teachers or classroom observers were requested to assess their student's behaviour on the following five items:

- “This young person is willing to participate in novel (or unfamiliar) numeracy activities”
- “This young person is willing to participate in novel (or unfamiliar) writing tasks”
- “This young person is willing to participate in novel (or unfamiliar) reading tasks”
- “This young person is willing to participate in novel (or unfamiliar) group activities”
- “This young person is willing to take educational risks or try novel or new school tasks”

Responses were sought on a five-point Likert scale with the following descriptors: “never”, “seldom”, “sometimes”, “usually” and “always”. Higher scale scores represent increased observation of educational risk taking.

7.2.3 Program Facilitator Questionnaire (Within Program)

Two within-program assessment measures were applied within this research. They were the Adolescent Behavior Checklist and the Operation Flinders Background Questionnaire. They are described as follows.

7.2.3.1 Adolescent Behavior Checklist

The Adolescent Behavior Checklist (ABC) is a 38-item behavioural observation checklist specifically designed for wilderness programs. It was completed by the Operation Flinders program facilitator (team leader) at two points in time (day 4 and day 8). The checklist was slightly modified by Mohr et al. (2001) from the checklist developed by Davis-Berman and Berman (1994b). The original scale had been used by a number of researchers in

evaluating participant behaviour elicited during group-based wilderness interventions (Orren & Werner, 2007) and was designed to provide an assessment of “important indicators of progress on therapeutic wilderness trips” (Davis-Berman & Berman, 1994, p. 154). The scale is comprised of seven subscales:

- *Interaction with Peers* – this is a five-item scale to assess the degree the participant acts in a friendly and responsive manner with peers, as opposed to a manipulative or threatening manner. Higher scores represent more positive interaction with peers.
- *Affect* – this four-item scale assesses emotional states related to depression, anxiety, suspiciousness and happiness. Higher scores represent the presence of more negative affective states.
- *Self-Esteem* – this six-item scale assesses verbal and non-verbal cues of how participants portray themselves to others. Higher scores represent the presence of higher observed self-esteem.
- *Conflict* – this five-item scale assesses the degree participants engage in conflict and confrontation with others. Higher scores represent increased levels of observed conflict.
- *Response Initiation* – this five-item scale assesses the spontaneous behaviour of participants as it relates to participants’ asking questions, or seeking responses from others. Higher scores represent participants demonstrating higher levels of willingness to initiate positive responses.
- *Co-operation* – this four-item scale assesses the degree the participant offered help to others and complied with the requests of others. Higher scores represent increased expression of cooperation.

- *Behavioural Incidents* – this is a nine-item scale designed to measure how often the participant verbally or physically threatened or assaulted another person. Higher scores represent increased evidence of behavioural problems.

Operation Flinders program facilitators were asked to score the frequency of observed behaviour, with responses provided on a seven-point continuum ranging from “1” representing “never”, with “7” denoting the frequency of “always”. In the instructions, a score of “4” was operationalised as the behaviour being performed approximately 50% of the time. The measure is provided in Appendix T.

7.2.4 Operation Flinders Background Questionnaire

The researcher was granted access to the Operation Flinders Background Questionnaire developed and used by Operation Flinders in their referral process (Appendix O). Referral agency personnel completed this questionnaire on participants prior to attending the program. This questionnaire taps demographic information relating to a participant’s school and community engagement, and a number of static risk variables relating to previous school (suspension and exclusion) and criminal (conviction) history. Of most importance to this research, the questionnaire included a 24-item checklist of behaviours indicative of educational disengagement, offending and poor wellbeing (e.g., attention problems, conflict with others, low self-esteem). Observers were asked to “rate the degree the participant is currently experiencing them” on a 10-point continuum ranging from “not at all” to “extremely severe”. The psychometric properties of the checklist were unknown at the time of the research.

7.3 Data Management

Data were entered into SPSS by a research assistant, with a protocol developed to guide the data entry in a consistent manner. The researcher manually audited approximately 10% of the data entry and an error rate of less than 0.0004% was achieved. This “raw data

set” was subject to six distinct steps prior to outcome analyses being conducted. The following flow diagram (Figure 7.2) summarises the six data management steps and resultant data sets. The systematic and step-by-step management of data and analysis remains a best-practice research consideration (King & Wincup, 2008) that promotes internal or descriptive validity (Perry, 2010), and supports efficient data use, collaboration and reuse (Donnelly, 2012). The steps articulated in Figure 7.2 are referred to throughout the remainder of this chapter.

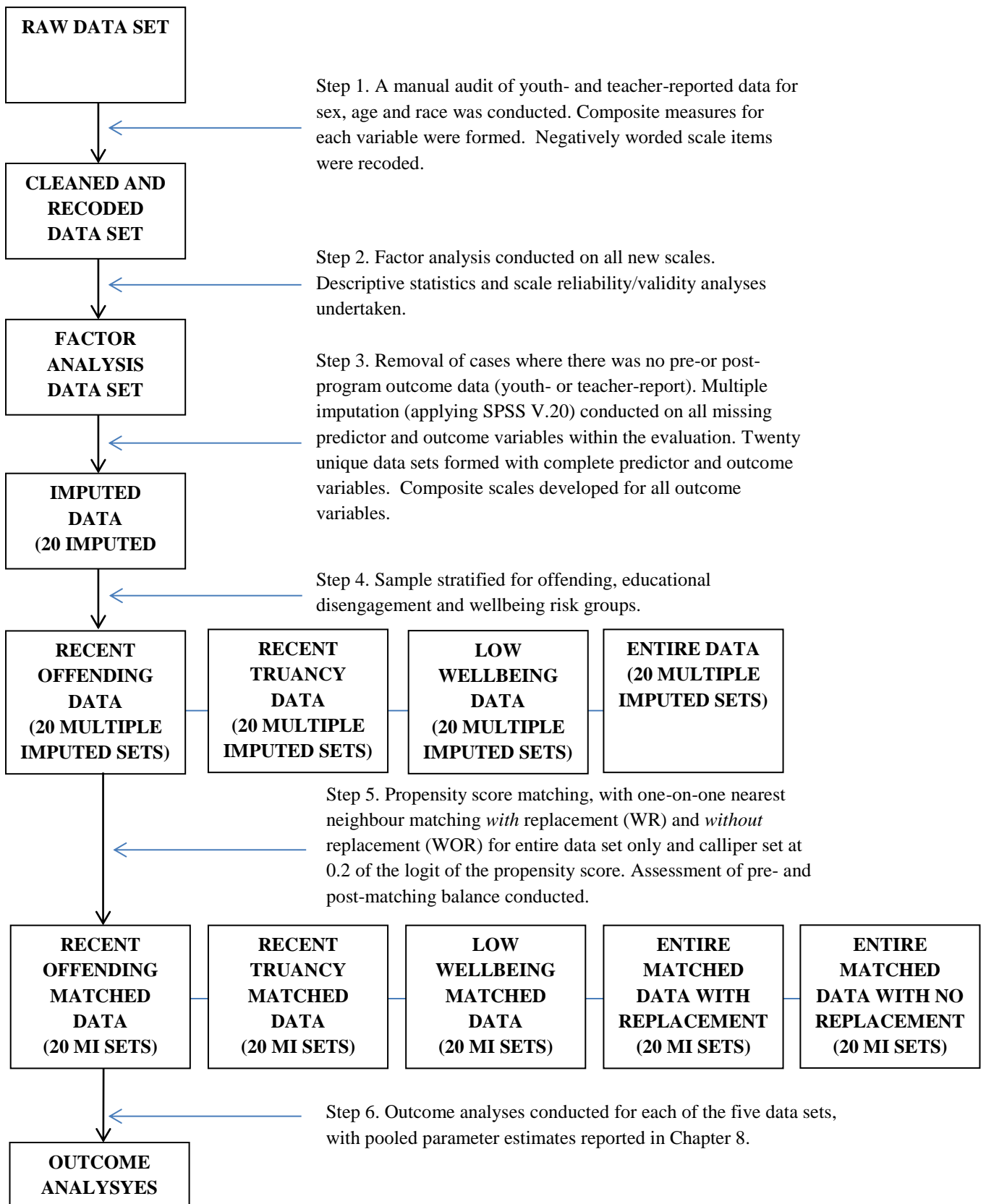


Figure 7.2 Workflow summary of data management

7.3.1 Data Management Step 1: Cleaning and Recoding

The researcher manually screened each questionnaire for response sets, diagonal answering and unusual patterns. Questionnaire scales assessed as unreliable (e.g., “uncertain” chosen for all responses, or when a response set was identified in a positively and negatively worded scale) were recoded as missing values. Pretest youth-report questionnaires were completed by a cohort ($n = 15$) of Indigenous young people from a remote part of Central Australia (APY Lands). While supporting the completion of the within-program procedure (day 8 of Operation Flinders program), the researcher identified that English was the cohort’s second language and given the observed comprehension impairments, the pretest questionnaires were assessed as unreliable.

Collectively, between 92% and 98% of all youth- and teacher-report scale measures were assessed as reliable (as per definition in previous paragraph). The youth-report scales tapping self-esteem, optimism and self-efficacy were more likely to be assessed as unreliable (ranging from 92% to 94%), with all three scales including both positive and negatively worded items. Approximately 90% of all youth-report questionnaires had no assessment of unreliability on any scale measure. Between 3% and 5% of youth-report questionnaires (in pretest and posttest, respectively) contained five or more scales assessed as unreliable.

Negatively worded scale items were recoded. The researcher manually cross-checked the teacher- and youth-reported variables for sex, year level, age and race, and composition measures for each variable was constructed. A new variable, rural versus city (metropolitan), was derived from participants’ school postcode. Postcodes designating suburbs greater than 50km from the metropolitan centres of Adelaide or Darwin were coded as “rural”. A variable tapping socio-economic status was constructed from the Socio-Economic Indexes for Areas (SEIFA) developed by the Australian Bureau of Statistics (ABS, 2011). This product ranks Australian postcode areas according to relative socio-economic advantage and disadvantage.

The indexes are based on information from the five-yearly Australian Census. The measure applied within the research is the Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD). Lower scores represent greater area disadvantage and a lack of advantage overall.

7.3.1.1 Youth- and Teacher-Report Static Risk Data

An important feature of the research design was the stratification of the sample based upon static risk factors. Risk items related to school suspension, truancy and exclusion history, and recent and historical offending were located in the pretest questionnaire completed by Operation Flinders and control group participants (Appendix P). Items assessing similar risk constructs (but worded differently) were located in the Operation Flinders Background Questionnaire (Appendix O). Table X.1 (Appendix X) summarises the inter-correlations between the youth and teacher-reported data. While the correlations are within the low range, convergent validity is provided for the use of the youth-report data to assess participant risk in main study. Of particular interest, compared to the youth-report data, referral agency personnel underreported (medium to large effect size) the prevalence of historical truancy, school suspension, exclusion and offending behaviour (Table X.2, Appendix X). This underreporting of participant risk by referral agency personnel was also found by Raymond (2003), and together, suggests that behavioural problems may fail to come to the attention of supporting teachers or adults. Alternatively, young people in the research may have over-reported historical behaviour, possibly for peer feedback or acceptance (e.g., grandstanding).

7.3.2 Data Management Step 2: Scale and Descriptive Analysis

The cleaned and coded data set (see Figure 7.2) was used to (1) conduct factor analysis on scales exhibiting uncertain factor structure, (2) assess the psychometric properties

of all measures and (3) conduct descriptive analysis of the Operation Flinders and control group participants.

7.3.2.1 Factor Analysis

In both Chapter 6 and 7, factor analysis was employed to identify latent variables that are reflected in the independent constructs (Bandalos & Finney, 2010). This section summarises the researcher's decision making processes (and associated evidence) in conducting the factor analyses reported within this thesis

While there are no clear guidelines for conducting factor analysis, Exploratory Factor Analysis (EFA) followed by Confirmatory Factor Analysis (CFA) is one of the most common approaches to scale development and validation, and it represents a best-practice recommendation (Worthington & Whittaker, 2006). The process of conducting factor analysis is an iterative process between researcher and method (Beavers et al., 2013; Tabachnick & Fidell, 2001), which involves multiple decision making points (Schmitt, 2011) and "few absolute guidelines" (Costello & Osborne, 2005, p. 1). It is recommended that scale developers should "clearly report all of the decisions, rationales, and procedures when using EFA and SEM [structural equation modelling] in scale development research" (Worthington & Whittaker, 2006, p. 834). The reporting of factor analyses within this research has been informed by this point, and widely accepted criteria (see Cabrera-Nguyen, 2010; Henson & Roberts, 2006).

Beavers et al. (2013) argued that at least 150 cases are required for an exploration of initial structure, and this condition was met within all analysis. The factorability of the scale items was assessed applying multiple recognised benchmarks (Beavers et al., 2013; Costello & Osborne, 2005). First, a correlation matrix (reported in Appendices) assessed the item inter-correlations. Second, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was assessed against the widely recommended threshold value of .6 (Costello & Osborne,

2005) and Bartlett's test of sphericity was assessed for significance. Third, the anti-image correlation matrix was assessed for high diagonal correlational loadings (Costello & Osborne, 2005).

In all cases exploratory factor analysis (EFA) was assessed as the most appropriate initial method to reduce the data and identify latent factors (Bandalos & Finney, 2010; Worthington & Whittaker, 2006). Both principal component analysis (PCA) and principal axis factoring (PAF) were applied as the extraction methods. While there is wide disagreement within the literature about which method should be applied (Beavers et al., 2013), the advantage of PAF is that it can respond to both normally-distributed or significantly non-normal data (Costello & Osborne, 2005). There is a strong argument for applying both techniques, and then conducting further analysis with the factor solution that best fits the data and conceptual underpinnings (Pett, Lackey, & Sullivan, 2003). Throughout this research, both PCA and PAF were conducted, but PAF was prioritised as the chosen method given its utility with non-normal data sets.

In order to identify the number of factors to be extracted, both the scree plot and eigenvalues were reviewed in all analyses. The Kaiser Criterion suggests that factors should be retained if their eigenvalues are greater or equal to one (Costello & Osborne, 2005), and the scree plot is reviewed for the evidence of significant bending (or evidence of an elbow). The latter remains a key criterion for factor identification (Costello & Osborne, 2005). In all cases both orthogonal (varimax) and oblique (oblimin) factor rotations were used to improve the interpretability of the factor solution. There is no widely accepted criteria for the use of these rotations, notably given that oblique rotations are most strongly supported within the literature, however, orthogonal rotations are both more cited and applied (Costello & Osborne, 2005). Beavers et al. (2013, p. 11) suggests that "if the factors are conceptually independent, then orthogonal rotation is acceptable; however oblique rotations are generally

more appropriate for social science research where the factors are usually related". The factor analyses reported within this thesis prioritised the application of oblique rotations.

In all analyses, variables were removed cautiously, with consideration of their correlation pattern with each factor and their applied and conceptual significance to the factor structure. As recommended by Bandalos and Finney (2010), when items were removed the factor analysis was conducted again. For a factor to be considered stable, it was required to meet two criteria. First, it was comprised of items with significant factor loadings (Costello & Osborne, 2005), and second, to be conceptually sound in light of theory and common sense (Beavers et al., 2013).

7.3.2.1.1 *Aspiration Index*

A 21-item modified version of the Aspiration Index (Kasser and Ryan, 1996) was employed to assess a participant's aspiration to extrinsic and intrinsic values. Factor analysis was undertaken to assess whether or not the instrument items loaded on two independent factors (N = 458). The factorability of the scale items was present, evidenced by (1) the inter-item correlations (Table X.3), (2) the KMO criteria being met (.87), (3) Bartlett's test of sphericity being significant ($\chi^2(210) = 3943.54, p < .001$) and (4) the anti-image correlation matrix exhibiting high diagonal correlational loadings.

PAF was used as the extraction method. While five factors had eigenvalues > 1 , an inspection of the scree plot showed a pronounced flattening effect after two factors were extracted. These factors explained 44.4% of the variance in the item scores. An oblimin rotation (with Kaiser Normalization) was used to improve the interpretability of the factor analysis for the two, three, four and five factors. This rotation was chosen because of the higher inter-correlation between both factors.

The two factors were hypothesised to correspond to intrinsic and extrinsic value orientation. Items related to participants' valuing wealth, fame and image loaded on the

extrinsic value orientation, while items related to an individual valuing personal relationships, personal growth and community contribution loaded on the intrinsic value factor. The background literature had previously indicated that items tapping the category of “good health” were not associated with either intrinsic or extrinsic value orientation (Kasser & Ryan, 1993). Within the current factor solution, items related to this category loaded strongly on the intrinsic value orientation. In summary, the following two factors were applied in the current research:

- *Extrinsic Value Orientation* – this nine-item scale assessed the degree an individual values or identifies with wealth, fame and image. Higher scores indicate increased extrinsic value identification.
- *Intrinsic Value Orientation* – this 12-item scale assessed the degree an individual values or identifies with positive health, relationships, personal growth and community contribution. Higher scores indicate increased intrinsic value identification.

The item factor loadings and communalities are summarised in Table 7.2. The two factors were moderately correlated ($r = .41$).

Table 7.2

Factor Loadings and Communalities on a Principal Axis Factoring Analysis (with Oblimin Rotation) for Aspiration Index (N = 458)

	Factor		
	Intrinsic	Extrinsic	Communality
You do things for the community	.56		.27
You are healthy	.59		.36
Lots of people know who you are		-.48	.29
You have lots of expensive things		-.68	.41
You give to charity	.56		.30
You are very fit	.47		.37
You make your own decisions	.48		.24
You have good friends	.53		.32
You are very fashionable		-.59	.41
You have lots of money		-.62	.40
You spend time with people you love	.68		.44
You understand yourself really well	.64		.40
You have lots of energy	.57		.38
People say you look good		-.62	.50
You make the world a better place	.52		.37
You are famous		-.69	.47
You have fun with people	.52		.34
You like yourself as you are	.66		.40
You are rich		-.71	.48
You do something that makes you famous		-.70	.47
People say you are attractive		-.69	.49

Note: Factor loadings < .3 are suppressed.

7.3.2.1.2 Operation Flinders Background Questionnaire Behaviour Checklist

The Operation Flinders Background Questionnaire (Appendix O) included a 24-item checklist of behaviours conceptually related to offending, educational disengagement and poor wellbeing (e.g., attention problems, conflict with others, low self-esteem). The factor structure and psychometric properties of the checklist were unknown at the time of research (N = 260). The factorability of the scale items was present, evidenced by (1) the inter-item correlations (Table X.4), (2) the KMO criteria being met (.91), (3) Bartlett's test of sphericity

being significant ($\chi^2(276) = 3780.26, p < .001$) and (4) the anti-image correlation matrix exhibiting high diagonal correlational loadings.

PAF was used as the extraction method. While five factors had eigenvalues > 1 , an inspection of the scree plot showed a flattening effect after three factors were extracted. Factors one to three explained 37.0%, 9.4% and 6.3% of the variance respectively. Oblimin (with Kaiser Normalization) and varimax rotation were conducted for three, four and five factor solutions. A three factor solution, explaining 52% of the total variance, was settled on for the final solution because of (1) flattening of the scree plot, (2) the insufficient number of primary loadings on the four and five factor solutions and (3) the definability of the three-factor solution around common psychological constructs. Comparisons between the oblimin and varimax solutions demonstrated few differences, and given the moderate inter-factor correlations ($r > .24$), the oblimin rotation was used for the final solution to aid interpretability.

Seven items were removed in the final solution. The items “learning difficulties”, “conflict with caregivers and family”, “hurting themselves”, “boredom”, “uses avoidance coping strategies”, “impulsivity” and “attention problems” were removed as they failed to reach a primary loading of 0.5 on any factor. The final PAF (oblimin rotation) was conducted with the remaining 17 items and the three factor solution explained 58.9% of the variance. All items had primary loadings above .60. While three items had cross loadings between .30 and .36, given the items’ high face validity with the broader factor, they were retained. The final factors were named and defined as follows:

- *Interpersonal Problems* – this seven-item scale assessed interpersonal problems evidenced by conflict, violence, bullying, oppositional behaviour and anger expressed within both peer and adult relationships. Higher scores represent increased interpersonal problems.

- *Social and Emotional Problems* – this five-item scale assessed social emotional problems evidenced by anxiety/depression, isolation, peer bullying, low self-esteem and social isolation. Higher scores represent increased social and emotional problems.
- *Risk and Deviancy* – this five-item scale assessed behaviours indicative of risk taking (including offending, alcohol and/or drug use), non-compliance, identifying with negative peers and disengaged behavioural patterns. Higher scores represent increased risk and deviancy.

The item factor loadings and communalities are summarised in Table 7.3. The three factors were moderately correlated, as summarised in Table 7.4.

Table 7.3

Factor Loadings and Communalities on Principal Axis Factoring (with Oblimin Rotation) of Operation Flinders Background Questionnaire Behaviour Checklist (N = 260)

	Factor			Communality
	Interpersonal Problems	Social and Emotional Problems	Risk and Deviancy	
Bullying peers (verbal/physical/excluding)	.93			.72
Violence or aggression to peers	.78			.62
Bullying peers (cyber/electronic)	.69			.50
Conflict with teachers or school staff	.69			.66
Violence or aggression to adults	.65			.59
Managing their anger	.64			.57
Refusing to follow adult direction	.60		.36	.68
Social isolation		.76		.54
Low self-esteem		.75		.61
Friendship issues	.30	.65		.60
Feeling anxious or depressed		.64		.50
Victim of bullying		.64		.44
Drug alcohol or substance use			.80	.62
Breaking the law			.79	.65
Not attending schools, programs or working			.65	.47
At-risk behaviour	.30		.63	.69
Identifies with delinquent peers or friends			.62	.57

Note: Factor loadings < .3 are suppressed.

Table 7.4

Inter-Factor Correlations of Operation Flinders Background Questionnaire

	Social and Emotional Problems	Risk and Deviancy
Interpersonal Problems	.29	.49
Social and Emotional Problems		.19

Note: All correlations are significant at the .05 level (two-tailed).

7.3.2.2 *Reliability and Validity*

Across both evaluation and research settings, scales should demonstrate a high level of internal consistency and validity for the evaluation cohort (Knapp & Mueller, 2010). Knapp and Mueller argued that within the social and behavioural sciences, reliability coefficients above the range of .7 to .8 are considered acceptable. The following section reports the reliability and validity evidence for all instruments applied within the main study.

7.3.2.2.1 *Scale Internal Consistency and Psychometric Properties*

Table 7.5 summarises the descriptive properties and internal consistency (Cronbach's Alpha) of all dependent measures. Apart from the optimism measure (pretest), the internal consistency of the youth- and teacher-report scales ranged from $\alpha = .70$ to $\alpha = .96$ (moderate to excellent range of internal consistency). The three-item optimism scale demonstrated low internal consistency ($\alpha_{\text{pretest}} = .53$ $\alpha_{\text{posttest}} = .47$). The item "things always go wrong for me" was removed which increased the internal consistency of the posttest scale to the acceptable range ($\alpha_{\text{posttest}} = .71$), however, the reliability of the pretest scale was within the fair range ($\alpha_{\text{pretest}} = .64$). Given the strong conceptual and empirical relationship between optimism and offending (see Table 2.1), educational engagement (see Table 2.2) and wellbeing (see Table 2.3), the measure was included within the research, albeit with this limitation noted.

All scales (applying total scores) in Table 7.5 were examined for skewness and kurtosis to assess the fit between the distribution of these variables and the assumption of normality. Apart from the Intrinsic Value Orientation measure (posttest), all skewness and kurtosis values were $< \pm 1$ and within the acceptable range to suggest normality. The Intrinsic Value Orientation measure demonstrated marginal positive skewing, but a visual inspection of the histogram supported the assumption of normality, and the scale's inclusion within the research was supported.

Table 7.5

Descriptive Statistics for the Youth- and Teacher-Report Dependent Measures

	Pretest						Posttest					
	n	Mean	SD	Skewness	Kurtosis	α	n	Mean	SD	Skewness	Kurtosis	α
Youth-Report												
Identification with Criminal Others	505	12.02	3.48	.69	.97	.71	441	11.64	3.26	.26	-.41	.70
Attitudes to Teachers	506	23.59	4.76	-.54	.54	.76	441	24.06	4.33	-.34	.60	.77
Satisfaction with Life	497	15.16	4.66	-.25	-.50	.88	433	15.66	4.41	-.34	-.16	.87
Optimism ^a	496	6.85	1.64	-.28	.31	.64	430	6.95	1.68	-.51	.32	.73
Self-Efficacy	499	13.77	3.00	-.31	.05	.71	434	13.99	2.92	-.30	.30	.72
Aggressive Impulses	501	20.33	8.32	.65	-.30	.92	439	18.06	7.92	.96	.33	.93
Attitudes to Police	500	24.54	5.72	-.72	.62	.87	424	25.21	4.75	-.26	.30	.79
Self-Esteem	485	14.61	4.06	-.10	-.25	.78	404	15.23	3.92	-.19	.01	.79
Intrinsic Value Orientation	505	46.52	7.66	-.67	.50	.85	432	47.05	7.73	-1.02	2.11	.88
Extrinsic Value Orientation	504	26.65	7.61	.18	-.38	.87	433	25.28	8.14	.11	-.35	.91
Teacher-Report												
BASE - Total	430	49.70	12.91	.10	-.15	.95	373	54.37	12.15	-.16	-.52	.96
BASE - Student Initiative	430	18.53	5.34	.14	-.41	.93	373	20.35	5.16	-.14	-.68	.93
BASE - Social Attention	430	9.75	2.89	-.16	-.54	.86	371	10.63	2.57	-.25	-.48	.83
BASE - Success/Failure	424	6.11	2.03	-.14	-.70	.90	372	6.72	1.75	-.33	-.28	.91
BASE - Social Attraction	428	9.03	2.70	.08	-.37	.80	373	9.82	2.55	-.01	-.37	.78
BASE - Self Confidence	428	6.25	1.85	.08	-.32	.81	368	6.89	1.72	-.26	-.28	.84
Educational Risk Taking	422	15.58	4.97	-.06	-.62	.95	357	17.25	4.64	-.27	-.34	.96

Note: ^aOne item removed from this scale (two-item factor).

Table 7.6 summarises the descriptive properties and internal consistency (Cronbach's Alpha) of the Operation Flinders Background Questionnaire Behavioural Checklist and Adolescent Behavior Checklist (ABC). All scales demonstrated moderate to excellent internal consistency, and were examined for skewness and kurtosis to assess the fit between the distribution of these variables and the assumption of normality. Apart from the Conflict and Behavioural Incidents subscales on the ABC, all scales suggested normality ($< \pm 1$). A visual inspection of the histogram for both the Conflict and Behavioural Incident measures indicated low levels of conflict and behavioural incidents being observed by program facilitators during the Operation Flinders program. This was characterised by a highly negatively skewed distribution. Collectively, strong evidence is provided that the subscales of both the Operation Flinders Background Questionnaire Behavioural Checklist and Adolescent Behavior Checklist are sufficiently robust for their intended purpose to assess convergent validity for the dependent measures applied within the research.

Table 7.6

Descriptive Statistics for Operation Flinders Background Questionnaire Behavioural Checklist and Adolescent Behavior Checklist (ABC)

	n	Mean	SD	Skewness	Kurtosis	Alpha
Operation Flinders Background Questionnaire (TR)						
Risk and Deviancy	332	18.21	11.55	.72	-.54	.87
Interpersonal Problems	329	25.73	15.72	.72	-.38	.91
Social Emotional Problems	325	20.81	10.01	.34	-.59	.83
Adolescent Behavior Checklist (FR)						
Interactions with Peers (day 4)	391	25.22	6.38	-.47	-.33	.76
Interactions with Peers (day 8)	390	27.34	6.34	-.87	.09	.82
Affect (day 4)	391	19.82	5.51	-.40	-.64	.81
Affect (day 8)	388	22.07	4.97	-.67	-.32	.82
Self-Esteem (day 4)	391	28.03	7.22	-.23	-.38	.78
Self-Esteem (day 8)	388	30.90	6.96	-.32	-.58	.81
Conflict (day 4)	391	13.77	9.01	.71	-.84	.94
Conflict (day 8)	390	11.76	7.98	1.12	.23	.93
Response Initiation (day 4)	391	16.25	6.39	.27	-.60	.82
Response Initiation (day 8)	386	15.35	5.54	.00	-.68	.84
Cooperation (Day 4)	391	17.57	6.16	-.14	-.92	.88
Cooperation (Day 8)	386	20.59	6.16	-.63	-.59	.91
Behavioural Incidents (Day 4)	390	13.62	7.99	2.62	7.85	.88
Behavioural Incidents (Day 8)	386	12.84	7.57	2.68	7.41	.91

Note. *TR* = teacher-report (completed by referral agency personnel, pre-program). *FR* = facilitator-report (completed by Operation Flinders program facilitators within the program).

7.3.2.2.2 Test-Retest Reliability

As a measure of test-retest reliability, the control group's pretest-posttest correlations are summarised in Table 7.7. Overall, the scales demonstrated a low to moderate level of test-retest reliability. This low coefficient pattern may be suggestive of poor measurement precision (measurement errors) and, if present, represents a threat to the internal validity of the outcome analyses (see Section 5.1.1). However, the pattern needs to be understood in the context of the moderately large test-retest period (three month) and the expected variability of

wellbeing and behavioural functioning with a youth-at-risk cohort. Lower test-retest reliability coefficients are expected under both conditions (Kamphaus & Frick, 2005).

Table 7.7

Control Group Pretest-Posttest Correlations (r)

Identification with Criminal Others	.58
Attitudes to Teachers	.66
Satisfaction with Life	.71
Optimism	.58
Self-Efficacy	.68
Aggressive Impulses	.72
Attitudes to Police	.73
Self-Esteem	.69
Intrinsic Value Orientation	.58
Extrinsic Value Orientation	.65
Behavioral Academic Self-Esteem (BASE – Total)	.65
Student Initiative	.63
Social Attention	.68
Success-Failure	.50
Social Attraction	.65
Self-Confidence	.56
Educational Risk Taking	.64

Note: All correlations significant at the .01 level (two-tailed). N range 137 to 159.

7.3.2.2.3 Convergent Validity

A correlation matrix that includes all (1) dependent measures, (2) within- and pre-program scales (3) and static risk predictors is provided in Appendix X (Table X.5). This section draws the reader's attention to the key correlational evidence related to the convergent validity of outcome measures employed within the main study. As a starting point, point-biserial correlations between dependent measures and static risk factors provide one measure of convergent validity. This is summarised in Table 7.8.

Table 7.8

*Point-Biserial Correlations (r) Between Static Risk Indices and Dependent Measures**(Pretest)*

	Pre-program criminal conviction ^a	Pre-program offending ^a	Pre-program alcohol consumption ^a	Pre-program truancy ^a	Pre-program suspension ^a	2013 suspension or exclusion (DECD) ^b
Identification with Criminal Others	.23	.31	.23	.22	.28	.25
Attitudes to Police	-.24	-.29	-.30	-.18	-.31	-.17
Attitudes to Teachers	-.06	-.13	-.11	-.11	-.22	-.17
Aggressive Impulses	.25	.27	.26	.23	.36	.34
Satisfaction with Life	-.16	-.09	-.16	-.14	-.20	-.16
Optimism	-.13	-.04	-.11	-.10	-.13	-.17
Self-Efficacy	-.11	-.04	-.04	-.16	-.08	-.17
Self Esteem	-.07	-.02	-.09	-.13	-.04	-.07
Intrinsic Value Orientation	-.04	-.00	-.08	-.14	-.22	-.18
Extrinsic Value Orientation	.08	.13	.07	-.01	.01	.01
Behavior Academic Self-Esteem Total	-.23	-.17	-.13	-.26	-.36	-.33
BASE - Student Initiative	-.24	-.17	-.12	-.26	-.32	-.29
BASE - Social Attention	-.20	-.21	-.11	-.22	-.42	-.32
BASE - Success-Failure	-.18	-.12	-.17	-.20	-.35	-.30
BASE - Social Attention	-.13	-.06	-.06	-.19	-.18	-.20
BASE - Self-Confidence	-.22	-.14	-.08	-.19	-.30	-.29
Educational Risk Taking	-.23	-.18	-.14	-.28	-.35	-.31

Note. Bold correlations are significant at $p < .01$. Italic correlations are significant at $p < .05$. ^aYouth-report measures. ^bElectronically recorded behavioural data.

Consistent with expectations, the Identification with Criminal Others, Attitudes to Police, Aggressive Impulses, Behavioral Academic Self-Esteem (BASE-Total) and Educational Risk Taking scales demonstrated a pattern of statistically significant correlations with the risk factors (ranging from .13 to .36 and in the direction expected). This pattern was also exhibited with the Attitudes to Teacher scale; albeit the correlations were smaller.

The measures conceptually related to wellbeing (self-esteem, self-efficacy, satisfaction with life, optimism, intrinsic and extrinsic value orientation) demonstrated a

pattern of small to negligible correlations (but in the direction expected), suggesting greater independence with the behaviourally orientated risk factors. Overall, lower levels of support for construct validity were found for the Extrinsic Value Orientation measure.

Table 7.9 provides a correlation matrix of dependent measures. Measures conceptually related to wellbeing (e.g., optimism, self-efficacy, satisfaction with life and self-esteem) demonstrated a pattern of moderate inter-scale correlations ($r > .46$). Convergent validity was also found between the measures conceptually aligned to the psychological (attitudes to teachers) and behavioural components (educational risk taking, behavioural expression of self-esteem within the classroom) of educational disengagement. While the youth-report measure tapping attitudes to teachers demonstrated a pattern of smaller inter-correlations with the teacher-report BASE and Educational Risk Taking measures ($r < .31$, $p < .01$), the latter two measures were strongly correlated ($r = .86$, $p = .001$). Measures conceptually related to offending (identification with criminal others, attitudes to police, aggressive impulses) also demonstrated moderate inter-construct convergent validity ($r > .33$, $p < .001$).

Table 7.9

Correlation Matrix of Dependent Measures (Pretest)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1 Identification with Criminal Others		-.40	-.32	.37	-.30	-.25	-.25	-.14	-.25	-.02	-.16	-.14	-.18	-.08	<i>-.12</i>	-.19	-.16	
2 Attitudes to Police			.43	-.33	.21	.23	.20	.07	.33	.03	.24	.22	.23	.19	.15	.23	.24	
3 Attitudes to Teachers				-.28	.17	.29	.31	.11	.35	-.03	.30	.27	.29	.21	.20	.31	.29	
4 Aggressive Impulses					-.42	-.34	-.28	-.39	-.25	.00	-.31	-.24	-.32	-.33	-.24	-.29	-.26	
5 Satisfaction with Life						.58	.46	.56	.30	.17	.20	.17	.14	.15	.26	.17	.11	
6 Optimism							.58	.50	.37	.19	.18	.16	.12	.11	.23	.20	.10	
7 Self-Efficacy								.52	.41	.16	.25	.23	.17	.14	.29	.26	.22	
8 Self Esteem									.24	.24	.13	.08	.06	.12	.24	.09	.06	
9 Intrinsic Value Orientation										.41	.18	.18	.07	.08	.23	.15	.18	
10 Extrinsic Value Orientation											-.06	-.04	-.13	-.11	.06	-.09	-.05	
11 Behavior Academic Self-Esteem (BASE- Total)												.94	.85	.82	.79	.88	.86	
12 BASE - Student Initiative													.73	.69	.68	.78	.85	
13 BASE - Social Attention														.74	.50	.74	.75	
14 BASE - Success-Failure																.53	.66	.66
15 BASE - Social Attention																	.69	.60
16 BASE - Self-Confidence																		.75
17 Educational Risk Taking																		

Note. Bold correlations are significant at $p < .01$. Italic correlations are significant at $p < .05$.

As discussed in Chapter 2 (see Table 2.1, Table 2.2 and Table 2.3), intrinsic value orientation was correlated, in the direction expected, with measures conceptually related to wellbeing, educational engagement and offending. For example, higher levels of intrinsic value orientation were correlated with positive attitudes to police ($r = .33, p < .01$), less identification with criminal others ($r = -.25, p < .01$), reduced aggressive impulses ($r = -.25, p < .01$), and greater levels of optimism ($r = .37, p < .01$), self-efficacy ($r = .41, p < .01$), self-esteem ($r = .24, p < .01$) and satisfaction with life ($r = .30, p < .01$). Conversely, the Extrinsic Value Orientation measure demonstrated a small positive correlation with constructs conceptually related to wellbeing (e.g., self-esteem) ($r > .17, p < .01$), but no consistent relationship with measures that are conceptually related to educational disengagement (e.g., BASE, attitudes to offending) or offending (e.g., attitudes to police).

The inclusion of the Operation Flinders Background Questionnaire Behavioural Checklist and the Adolescent Behavior Checklist provided a further source to assess construct validity. For example, young people reporting higher levels of aggressive impulses (Aggressive Impulses scale) were assessed by referring agencies in the Operation Flinders background questionnaire with increased levels of interpersonal problems ($r = .45, p < .001$) and a risk and deviancy behavioural profile ($r = .31, p < .001$). They were also more likely to exhibit behavioural incidents ($r = .37, p < .001$) during the Operation Flinders program, as assessed by Operation Flinders' team leaders. Young people exhibiting behavioural incidents during the program were also likely to demonstrate more negative behaviour within school settings, as assessed by the total BASE ($r = .37, p < .01$). Furthermore, Operation Flinders participants assessed by referring personnel with a pre-program risk and deviancy behavioural profile had higher levels of identification with criminal others ($r = .36, p < .001$), negative attitudes to police ($r = -.29, p < .001$), and lowered self-esteem as behaviourally expressed within the classroom (BASE Total, $r = -.40, p < .001$).

Conversely, the teacher- and youth-report measures purported to assess self-esteem within the research demonstrated a pattern of small inter-correlations, many of which did not reach statistical significance. For instance, the youth-report assessment of self-esteem had a small relationship with the BASE total ($r = .13, p < .05$), and the self-esteem subscale on the Adolescent Behavioural Checklist ($r = .09, n.s.$). Both later measures assessed the behavioural expression and observation of self-esteem within classroom and wilderness environments, and these constructs would appear independent of the youth-report attitudinal assessment of self-esteem.

7.3.2.2.4 Summary

Collectively, the dependent measures (as summarised in Table 7.9) exhibited sound psychometric properties, in terms of adequate reliability and convergent validity. Given the low internal consistency of the Optimism measure, cautious use and interpretation is warranted. The measure assessing extrinsic value orientation demonstrated a pattern of small and inconsistent cross-correlations with the static risk and dependent measures. However, given the pattern of small inter-correlations with measures conceptually related to wellbeing, it is retained within the research.

Consistent evidence was found that constructs conceptually related to either wellbeing or externalising behaviours (e.g., educational engagement and offending) demonstrated a pattern of stronger within-construct loadings, and smaller cross-construct loadings. This supports the interdependent nature of wellbeing and externalising behavioural problems, and the importance of stratifying the participant cohort in terms of both aspects within the outcome analyses.

7.3.2.3 Descriptive Data

The following section details the engagement and responses rates, and the descriptive properties of the Operation Flinders and control groups.

7.3.2.3.1 *Engagement and Response Rates*

In 2013, 61 referral agencies and/or schools referred young people to one of five Operation Flinders program waves. In total, 414 young people participated in an Operation Flinders program. Consent was provided by 59 school principals or agency managers (96.7% engagement rate) for their school or agency to be involved in the evaluation process. In total, data was collected relating to 414 Operation Flinders participants and 223 control group participants¹⁹. Table X.6 summarises the descriptive and static risk data for the entire sample. Across the five waves, 30.8% of the Operation Flinders participants were female, 18.4% identified themselves as Aboriginal and 52.7% came from rural referral agencies. Operation Flinders leadership reported that this high rural representation can be explained by the strong engagement by regional South Australian schools and referral agencies with the Operation Flinders program. The mean age of the Operation Flinders participant group was 15.1. Of most interest in Table X.6 is the comparative analysis column. There was a significant difference in the demographic and risk profiles of Operation Flinders and control group participants in terms of sex, suspension history, exclusion history, recent truancy and criminal conviction (see bold χ^2 statistics). The significantly higher risk profile of the participant group suggested sampling bias in the recruitment of the control group. This was supported by feedback from a number of referral agencies where convenience sampling was reported in relation to the selection some of control group members (for further discussion see Section 7.1.6).

In 2013, 81% of all young people who attended an Operation Flinders program completed a pretest questionnaire. However, across the pretest and posttest, and youth- and teacher-report measures, there were moderate levels of missing data, relating to individual variables, scales and complete questionnaires. Complete pretest data sets (youth and teacher-

¹⁹ Ethical consent was granted for de-identified background data to be collected on all Operation Flinders participants attending a 2013 program.

report) were obtained for 59% of participants attending the Operation Flinders program.

Table 7.10 summarises the response and attrition rates for the completion of youth- and teacher-report measures (assessed as valid) for both Operation Flinders and control group participants.

Table 7.10

Response and Attrition Rates for Operation Flinders and Control Group Participants

	Operation Flinders			Control Group		
	Pretest (n)	Posttest (n)	Attrition (%)	Pretest (n)	Posttest (n)	Attrition (%)
Youth-Report Questionnaire	325 ^a	276	15.1%	191	159	16.7%
BCQ (TR) ^b	283	222	21.6%	171	147	14.0%
BASE (TR) ^c	265	204	27.9%	165	137	17.0%
Complete Data Sets	235 ^d	163	30.6%	139	109	21.6%

Note. ^a78.5% of entire sample (N = 414). ^bBehaviour Change Questionnaire (Teacher-Report). ^cBehavior Academic Self-Esteem (Teacher-Report). ^dThe complete data set includes both the youth- and teacher-report questionnaires.

The recruitment and response rates for control group participants met researcher expectations for both the youth- (n = 191) and teacher-report (n = 165 to 171) measures. The attrition rates for the youth-report questionnaire were similar across both the Operation Flinders and control group participants, while there was evidence of increased attrition in the Operation Flinders group, compared to the control group, for the teacher-report measures. Taken on a whole, the attrition rates were lower than previous evaluations (Mohr et al., 2001; Raymond, 2003), and were within the anticipated range given the applied nature of the research.

7.3.2.3.2 Participant and Control Group Descriptive Data

Complete pretest posttest data sets were obtained for 163 Operation Flinders and 110 control group participants. The demographic and static risk profile of these groups are

summarised in Table 7.11. Operation Flinders participants were more likely to have had a history of school suspension and exclusion, and criminal conviction. This risk disparity also translated to higher levels of offending and truancy behaviour occurring in the previous month for the Operation Flinders participants. The comparative column indicates that the differences were only statistically significant for school suspension and living with both parents variables (see bold χ^2 statistics). That is, 55.6% of Operation Flinders participants had a suspension history, compared to 33.9% of the control group, and the control group cohort was more likely to be living with both parents. Collectively, sampling bias in the recruitment of the control group was evidenced in the complete data set. This bias was assessed as posing a significant threat to the internal validity of the outcome analyses.

Table 7.11

Static Risk Indices and Demographic Data for Operation Flinders (n = 163) and Control Group (n = 110) Participants with Complete Pre- and Post-Program Data Sets

	Operation Flinders	Control Group	Comparative Analysis
Female	44.2%	48.6%	$\chi^2(1, N = 272) = .52, p > .05$
Aboriginal	16.0%	14.7%	$\chi^2(1, N = 273) = .09, p > .05$
Mean Age	15.12	15.08	$t(249) = .24, p > .05$
Range of Age	13 to 18	13 to 18	n/a
Rural	61.3%	60.9%	$\chi^2(1, N = 272) = .02, p > .05$
Living with Both Parents	40.3%	54.2%	$\chi^2(1, N = 266) = 5.02, p = .03$
>= 1 Suspension	55.6%	33.9%	$\chi^2(1, N = 271) = 12.22, p < .01$
>=1 Exclusion	14.2%	7.3%	$\chi^2(1, N = 271) = 3.03, p = .08$
>= 1 Truancy	24.4%	20.2%	$\chi^2(1, N = 271) = .41, p > .05$
>= 1 Broken Law	17.4%	12.8%	$\chi^2(1, N = 270) = 1.02, p = .30$
>= 1 Criminal Conviction	12.5%	9.3%	$\chi^2(1, N = 267) = .64, p > .05$
>= 1 Consumption of Alcohol	26.9%	27.1%	$\chi^2(1, N = 267) < .01, p > .05$

Note. Complete data sets include youth- and teacher-completed questionnaires (pretest and posttest), where at least one scale was assessed as reliable for inclusion within the study.

7.3.3 Data Management Step 3: Multiple Imputation

The missing scale and questionnaire data across the two assessment points, and between the youth- and teacher-report measures (see Table 7.10), was assessed as a threat to the study's internal and external validity (D'Agostino Jr & Rubin, 2000; McKnight et al., 2007). The management of missing data requires a detailed understanding of the assumptions underpinning missing variables (Baraldi & Enders, 2010; Donders, van der Heijden, Stijnen, & Moons, 2006). There are three primary assumptions underpinning missing data patterns (Rubin, 1976). First, data which is missing completely at random (MCAR) occurs when the missing pattern is unrelated to the study variables. Missing at random (MAR) describes "systematic missingness where the propensity for missing data is correlated with other study-

related variables in an analysis” (Baraldi & Enders, 2010, p. 7). This brings less stringent assumptions regarding the missing data. Finally, missing not at random (MNAR) occurs when data is missing due to factors that are important but not observed within the study.

A review of the demographic and risk indices profile of the broader study cohort (Table X.6), compared to the retained participant group (Table 7.11), indicated that the retained sample had a higher proportion of Operation Flinders participants who were female (44.2% to 30.4%) and originated from rural locations (61.3% to 52.7%). The retained Operation Flinders sample also had a lower risk profiles related to recent offending (17.4% to 23.1%), criminal conviction (12.5% to 21.5%), school suspension (55.6% to 63.2%), truancy (24.4% to 34.7%), alcohol consumption (26.9% to 34.3%) and school exclusion (14.2% to 17.8%). The direction of the disparity was also replicated with the control group, although the magnitude of differences was marginally smaller. In summary, incomplete or missing data was more likely to occur for male participants from metropolitan locations and for young people with higher risk profiles related to previous offending, suspension, exclusion and alcohol consumption. Given the pattern of missingness was related to variables captured within the study, the current data was assessed as meeting the assumptions of MAR.

There are number of different approaches to managing missing data (see Baraldi & Enders, 2010; McKnight et al., 2007), and traditional approaches such as listwise deletion, pairwise deletion, utilising dummy variables to indicate missing data and nonresponse weighting. Deletion approaches are widely accepted as being “flawed” (Baraldi & Enders, 2010) and not appropriate (Schafer & Graham, 2002) for MAR data sets as they increase the risk of producing misleading results (Janssen et al., 2010). In contrast to single imputation techniques that impute one value for missing data, multiple imputation (MI) involves the creation of several data sets with imputed values replacing missing data. Data analysis is then carried out, and each data set is examined separately to assess parameter estimates and

standard errors, where the effects are aggregated across the data sets. MI's performance has been specifically noted as being superior to other approaches to missing data (Graham, Olchowski, & Gilreath, 2007; McKnight et al., 2007; Schafer & Graham, 2002), but in particular in the application of propensity score methods (Mattei & Mealli, 2009), which was employed in the next data management step. MI provides unbiased estimates and more accurate parameter estimates of MAR data sets (Baraldi & Enders, 2010). Given that missing data can lead to bias, the use of MI as an analytic technique allows for larger sample sizes and also increases the generalisability of the analyses relative to deletion-based approaches to missing data (Little & Rubin, 2000).

Prior to conducting MI, cases were deleted where there was no pretest or posttest (youth or teacher-report) outcome data. MI, using SPSS V.20, was conducted on missing predictor and outcome variables for both Operation Flinders and control group participants. While it is recommended that all variables applied within the analysis model must be included within the imputed models (Graham, 2009), Graham recommends that the number of imputed variables is maintained below 100. Given the high number of scale items and variables within the study ($k > 350$), scale, rather than item, level imputations were conducted, as recommended by Graham (2009).²⁰ While Monte Carlo simulations support the use of item rather than scale level imputations for their power advantage in future analyses, both types of imputation produce the same scale-level parameter estimates (Gottschall, West, & Enders, 2012). The MI employed within the study implemented an “inclusive” approach to variable selection, by including wide ranging auxiliary variables within the imputed model (Collins, Schafer, & Kam, 2001). The inclusion of auxiliary variables (e.g., SES, exclusion history, rural versus city), not required within the specific outcome analyses, provided a further means to minimise possible causes of missingness and reduce possible bias (Collins et

²⁰ MI was applied using scale items for the BCQ (Youth- and Teacher-Report). As noted within Chapter 6, the development of the BCQ subscales and the variable “Problem Awareness” required complex recoding that could only occur after all imputed scale items had been generated.

al., 2001). It is widely agreed that the MAR assumption cannot be verified easily within data sets, however, it becomes plausible as more variables are included in the imputation model (Schafer & Graham, 2002), thus further supporting this inclusive approach. A complete list of imputed variables, including the percentage of missing data per individual variable, is summarised in Table X.7. Data were missing for 22.6% of the total number of values.

There is disagreement in the literature regarding the number of imputed models to be generated. While 3-5 imputations were initially considered to be sufficient (Schafer & Graham, 2002), there is increasing evidence that many more imputations are required than previously reported (Graham et al., 2007; White, Royston, & Wood, 2011), notably when there is high levels of missing data (Graham et al., 2007). In the current study, 20 imputed data sets were generated. This number is recommended by Graham (2007) for data sets containing approximately 30% of missing data and to maintain power at an acceptable level (< 1% falloff).

The use of MI to impute missing data specific to the longer-term educational data collected in the follow-up study warrants further comment. Approximately 33% of 2014 (post-program) educational data were missing. This assessed the variables: (1) School Attendance Rate, (2) School Unexplained Absences, (3) School Explained Absences and (4) School Suspension/Exclusion (DECD). In the year following the completion of the Operation Flinders intervention, 90 participants (59 Operation Flinders, 31 Control) were no longer enrolled in school. Despite this, for 60% of these participants, 2014 educational data were provided to the researcher. Missing data for the remaining participants was likely to be associated with non-school enrolment at the point of data collection. However, given that 2014 educational data were available for the majority of young people that had left school within 12 months of the completion of the Operation Flinders program, missing data were imputed for all 2014 educational variables. The impact of this decision on the internal

validity of the outcome analyses, specific to the long-term educational data, is discussed in Section 7.3.6.1.

7.3.4 Data Management Stage 4: Sample Stratification

The study sought to evaluate the effectiveness of the Operation Flinders wilderness program for young people at risk of (1) offending, (2) educational disengagement and (3) poor wellbeing. There was a requirement to stratify the participant sample on the basis of risk. Chapter 2 provides a summary of static risk factors predictive of youth offending (Table 2.1), educational disengagement (Table 2.2) and poor wellbeing (Table 2.3). A large number of these variables were assessed in the main study (see evaluation framework, Table 5.1). Given that historical behavioural problems are one of the strongest predictors of future behaviours (Andrews & Bonta, 2010a), six key static risk factors conceptually related to offending, educational disengagement and wellbeing were included within the study. Table 7.12 summarises the number of Operation Flinders and control group participants who presented with the specified risk factor (following multiple imputation).

Table 7.12

*Pooled Static Risk Data for Operation Flinders (n = 345^b) and Control Group (n = 209^b)
Participants Following Multiple Imputation²¹*

	Operation Flinders		Control Group	
	%	n ^b	%	n ^b
Pre-program suspension	65.2%	225	39.2%	82
Pre-program exclusion	19.5%	67	14.4%	30
Pre-program truancy ^a	39.2%	135	30.8%	64
Pre-program offending ^a	28.5%	99	24.0%	50
Pre-program criminal conviction	22.1%	76	12.4%	26
Pre-program alcohol consumption ^a	39.2%	135	39.4%	82

Note: ^aTruancy, offending (defined as “breaking the law”) and alcohol consumption in the month prior to the start of the Operation Flinders intervention. ^bFigures rounded to nearest full integer.

The study was designed to detect medium effect size outcomes ($d = 0.4$; $\alpha < .05$). Applying Cohen’s (1992) conventions, a minimum of 64 cases were required in both the treatment and comparison groups. Applying this to Table 7.12, only suspension, truancy and historical consumption of alcohol met the minimum sample size for risk to be stratified on these variables. Offending risk, as individually operationalised through historical criminal conviction or breaking the law in the month prior to the Operation Flinders intervention, did not meet the sample size threshold requirements. To meet power requirements, offending risk was operationalised by young people reporting one (or both) of the following: (1) pre-program criminal conviction or (2) pre-program breaking the law. The subsequent offending risk group included 132 Operation Flinders and 61 control group participants. This approached the desired sample size to detect medium size outcomes (Cohen, 1992).

²¹ This table includes static risk data most strongly related to future risk of educational disengagement and offending (see Chapter 2).

Risk of educational disengagement was operationalised as the presence of school truancy in the month prior to the start of the Operation Flinders intervention. Given that pre-program suspension or exclusion are historical markers of risk (e.g., possibly occurring 2-3 years prior to intervention), pre-program truancy was assessed as the most accurate assessment of school-related risk at the point of intervention.

Wellbeing is a multi-dimensional construct that is widely operationalised through both broad-based ecological indices and subjective reports (AIHW, 2012; UNICEF, 2007). As discussed in Chapter 2, this research restricts itself to the operationalisation and assessment of subjective wellbeing which is a “broad category of phenomena that includes people’s emotional responses, domain satisfactions and global judgements of life satisfaction” (Deiner et al., 1999, p. 277). The cognitive component, defined as “satisfaction with life”, was assessed within the study. Life satisfaction has been applied as a marker for population mental health (Bray & Gunnell, 2006), and has been widely used to assess adolescent wellbeing (Antaramian et al., 2008), including young people at risk of educational disengagement (Lewis et al., 2011) or presenting with maladaptive behaviours (Lyons et al., 2014).

The study operationalised wellbeing risk through participant scoring on the Satisfaction with Life Scale. The use of this measure was made on two grounds. First, satisfaction with life is widely regarded as global measure of subjective wellbeing (Park, 2004b). Second, the scale demonstrated sound psychometric properties, with strong internal consistency ($\alpha > .87$) and evidence of convergent validity with constructs conceptually related to wellbeing (self-efficacy, self-esteem, optimism, intrinsic value orientation). Young people who scored below the median on the Satisfaction with Life scale at the pretest (< 14.2)

were assessed as being at higher future risk of poor wellbeing. This risk group included 95 and 176 control and Operation Flinders participants²².

In summary, the outcome analyses in Chapter 8 are stratified on the basis of the following four groups:

- *Entire Sample* – this includes all Operation Flinders and control group members where at least one outcome measure was completed.
- *Offending Risk Group* – this group isolates Operation Flinders and control group members who reported having broken the law on one or more occasion in the month prior to the start of the Operation Flinders program or had a pre-program criminal conviction.
- *Educational Disengagement Risk Group* - this group isolates Operation Flinders and control group members who reported having truanted from school on one or more occasion in the month prior to the start of the Operation Flinders program.
- *Wellbeing Risk Group* – this group isolates Operation Flinders and control group members who scored below the median on the Satisfaction with Life scale at the pretest.

Table 7.13 summarises the number and percentage of Operation Flinders and control group participants located within each risk group. Over 54.5% of control and Operation Flinders participants in the offending and educational disengagement risk groups were also in one or more of the other risk groups. The wellbeing risk group included a smaller percentage (< 44.8%) of inter-group cross-over, indicating that the cohort of young people within this group demonstrated greater independence from the other two risk groups. However, collectively, Table 7.13 shows that a young person presenting with a risk factor related to

²² In an exploratory analysis, the wellbeing risk group was stratified by participants' scoring in the lower half of the SWL scale (e.g., < 12.5). Following Propensity Score Matching (Section 7.3.5), the size of the control group in the matched sample was < 50 cases, and to increase the power of this analysis, stratification was made on the basis of the median SWL score.

offending, educational disengagement or poor wellbeing is also likely to present with a risk factor related to another grouping. This suggests that the propensity score matching (PSM) models introduced in the next section are not truly independent. That is, participants are likely to be in more than one PSM model.

Table 7.13

Percentage of Inter-Group Crossover of Operation Flinders and Control Group Participants

	Offending Risk		Educational Disengagement Risk		Wellbeing Risk	
	Operation Flinders	Control Group	Operation Flinders	Control Group	Operation Flinders	Control Group
Offending Risk ^a	n/a	n/a	58.6%	60.6%	59.5%	54.3%
Educational Disengagement Risk ^a	57.2%	57.2%	n/a	n/a	54.5%	61.1%
Wellbeing Risk ^a	44.8%	34.8%	42.0%	41.5%	n/a	n/a

Note: ^aThe percentage figures are based upon the proportion of young people presenting with this risk factor.

Further analysis indicated that approximately 74.5% of Operation Flinders and 63.9% of control group participants were in one or more of the risk groups²³. This disparity between groups provides further evidence for sampling bias within the study.

7.3.5 Data Management Stage 5: Propensity Score Matching

In order to assess program effectiveness, outcome scores assessing the impact of program attendance on the participants' pre- and post-program psychological or behavioural functioning, compared to the functioning of the control group, were required to be assessed. However, given the evidence of sampling bias (or non-equivalence of the control group) within the main study, direct group comparison was contraindicated (Little & Rubin, 2000; May, 2012; Stuart & Rubin, 2008). Outcome evaluations that do not control for confounding

²³ A dichotomous variable, titled "risk present", was formed with the coding "0" = no risk group, "1" = one or more risk groups. This variable was applied within the propensity score matching models (Section: 7.3.5).

factors are at high risk of reporting erroneous results (Rudner & Peyton, 2006). May (2012) suggests that there is no universally accepted way to statistically or practically respond to “non-equivalent comparison design”. However, the tapping of multiple risk and demographic factors within the main study provided the conditions to identify and then control for important confounding covariates (May, 2012; Stuart & Rubin, 2008). The research employed propensity score matching (PSM) to address non-equivalence between treatment and control groups. PSM models were constructed for the three stratified risk groups and the entire sample. Chapter 8 summarises the development of each propensity model, including the specific decision making points related to that model. It also includes the pre- and post-matching data (balance statistics) for each model, and the key threats specific to each model’s internal and external validity. This section describes PSM and the decision making points related to the implementation of this statistical approach.

PSM is a widely recognised technique to respond to studies where treatment and control groups differ on one or more confounding variable (Little & Rubin, 2000). The technique was introduced by Rosenbaum and Rubin (1983) within observational studies, but then applied to evaluation and control group research (Rosenbaum & Rubin, 1985). PSM is a recommended statistical process within criminological research for non-equivalent control groups (Apel & Sweeten, 2010), and is being increasingly applied across educational (Fan & Nowell, 2011; Gormley, Phillips, Newmark, Welti, & Adelstein, 2011; Rudner & Peyton, 2006), psychological (Harder, Stuart, & Anthony, 2010; O’Connor & Jose, 2012), forensic (Onifade, Wilkins, Davidson, Campbell, & Petersen, 2011) and medical research settings (Austin, 2008).

PSM is comprised of a number of distinct stages, with individual decision making points and assumptions underpinning each stage (for review see Caliendo & Kopeinig, 2005; Guo, Barth, & Gibbons, 2006). The development of a propensity model often requires

multiple iterations (Austin, 2008) with the exploration of different parameters and algorithms, with the aim of developing a model that balances baseline covariates in the treated and control groups.

PSM was performed with IBM SPSS Statistics 20 (SPSS Inc) and R statistical software Version 2.12, as per guidelines provided by Thoemmes (2012). The Propensity Score Matching Dialogue (V 3.0.2) was developed by Thoemmes (2011), and was supported by the underlying R packages: MatchIt, RIttools and cem (Hansen, 2004; Hansen & Bowers, 2008; Ho, Imai, King, & Stuart, 2007; Imai, King, & Stuart, 2008). PSM was conducted following the three step process articulated by Guo et al. (2006), with reporting occurring as per the suggestions of Austin (2008).

In the first step, control and Operation Flinders participants were recoded as “0” and “1” respectively as the “treatment” variable. A logistic regression model was conducted with “treatment” as the dependent variable and the inclusion of designated covariates. A propensity score (the likelihood of receiving the treatment) was computed for each participant, whether they are a control or receive the Operation Flinders intervention. Each individual who receives the treatment can be matched with a control using this propensity score. There are different opinions regarding the number of imputed covariates. The inclusion of many covariates in small samples may result in higher variance, since controls or participants are either discarded or have to be used on multiple occasions (Caliendo & Kopeinig, 2005). Conversely, restricting the number of variables leads to an increased risk that the control and treatment groups will differ on an unknown confounded variable. The study adopted the widely held position that variables should only be excluded if they are unrelated to the outcome or are not a meaningful covariate (Rubin & Thomas, 1996). In total, 71 covariates were isolated for possible inclusion within each PSM model, and to assess the pre- and post-matching balance of treatment and control groups. While the included

covariates were restricted by the initial research design and questionnaire planning, all variables have a strong conceptual and theoretical relationship with offending (see Table 2.1), educational disengagement (see Table 2.2) and poor wellbeing (see Table 2.3).

Propensity score models were manually conducted for each of the 20 MI data sets specific to the entire sample, and for the three stratified groups (offending, educational disengagement and poor wellbeing). As detailed in Chapter 8, the PSM models were less stable for the three stratified groups, with a high number of control and Operation Flinders participants being discarded. As recommended by Caliendo and Kopeinig (2005), this was overcome by using a smaller number of predictor covariates in these models. Tables provided in Appendix Y details the complete list of pre- and post-matching balance covariates, including whether the covariate was applied in the final PSM model. The definitions of all PSM covariates employed within this research can be found in Table Z.1 (Appendix Z).

In step two, control and treatment participants were matched on the basis of their propensity scores. While there is a variety of matching algorithms and no set rules for their individual application (for review see: Caliendo & Kopeinig, 2005; Guo et al., 2006), the study employed nearest neighbour 1:1 matching. This matching process is the most straightforward and widely applied (Caliendo & Kopeinig, 2005; Huston & Bentley, 2010) and permits multivariate analysis (Guo et al., 2006). It involves a member of the control group being matched to a treated individual based upon the closest match in propensity score. Under this algorithm, a control participant can either be used only once as a match (without replacement), or it can be put back into the pool for further and additional matching (with replacement). As reviewed by Caliendo and Kopeinig (2005) and others (Austin, 2011), researchers conducting PSM are continually engaged in a trade-off between variance and bias in PSM model development. Caliendo and Kopeinig (2005) note that matching without replacement leads to reduced quality of matching and increased bias, however, it maximises

sample variance. Conversely, matching with replacement reduces bias at the expense of also reducing variance. Matching with replacement is recommended in cases where the propensity score distribution is different between the treatment and control groups (Caliendo & Kopeinig, 2005). In other words, if there are many participants in the treatment group who have high propensity scores, but fewer in the control group, the matching process will generate poor matches. As part of the iterative process, nearest neighbour matching with replacement and without replacement was undertaken for the entire sample and three stratified groups. For the entire sample only, Chapter 8 provides the results for the outcome analyses related to both matching *with* and *without* replacement. It is widely recommended that both approaches are applied, and outcome results that demonstrate consistency across matching processes are considered robust in nature (Monahan, Lee, & Steinberg, 2011). For the stratified risk groups, the PSM models were restricted to matching with replacement for the following two reasons. First, the propensity score distribution was different between the treatment and control groups (lower number of controls had high propensity scores). Second, this approach was applied to increase the external validity of the outcome analyses. Given there was a lower number of control participants, matching without replacement reduced the size of the intervention group.

A risk of the nearest neighbour matching algorithm is that poor matches may occur if two neighbours' propensity scores are too far away. To minimise this confound, a calliper was applied to define the tolerance or maximum acceptable difference between propensity scores. Through Monte Carlo simulations, Austin (2011) recommended that researchers “match on the logit of the propensity score using callipers of width equal to 0.2 of the standard deviation of the logit of the propensity score” (p. 150). However, Guo et al. (2006) recommend that PSM should be conducted in an iterative manner, where the calliper is adjusted and the resultant models are assessed for treatment and control group balance, and

the number of matches. It is recommended that researchers “should try different calliper sizes, check the sensitivity of the results to different callipers, and choose one that seems best” (Guo et al., 2006, p. 11). For each PSM model, three different calliper sizes were tested. This included 0.2 of the standard deviation of the logit of the propensity score, and a calliper $\pm .03$ from this score. Across all models, reducing the calliper width led to a large reduction in the number of matched samples, while increasing the width only translated to a small increase in matched samples, but there was an associated increase in the number of variables that had a small standardised difference between treatment and control groups (post-matching). In line with the recommendation by Austin (2011), the final PSM models were conducted with a calliper of 0.2 of the standard deviation of the logit of the propensity score. The specific calliper for each model is specified in Chapter 8.

Following matching, the assessment of pre- and post-matching balance remains an important criterion for researchers (Austin, 2008). While there is a number of possible statistical processes, the assessment of standardised differences between treatment and control group members, across individual variables, is a recommended reporting measure (Ho et al., 2007; Imai et al., 2008). For each of the 71 covariates, standardised differences were computed, and this is reported in pre- and post-matching tables (Appendix Y). Effect size differences within the small range ($d > 0.2$, $\phi > 0.1$)²⁴ are highlighted in the tables and discussed in Chapter 8 to assess the final balance of each PSM model.

In summary, PSM represents a robust method to respond to non-equivalent groups. It is recognised, however, that a perfect balance between covariates in the treated versus untreated groups will not be fully achieved and it is possible that the matched samples may differ on an unmeasured covariate (Austin, 2008). Furthermore, PSM as a statistical process is optimised with larger samples (Rubin, 1997) and, as noted in Chapter 8, the stratification of

²⁴ Benchmarked against Cohen’s (1998) conventions.

the sample on the basis of participant risk has significantly reduced the sample size and this has impacted on matching quality for the stratified groups. The development, strengths and weaknesses of the five PSM models are discussed in Chapter 8.

7.3.6 Outcome Analyses

After matching has occurred, there are a number of methods that can be used to estimate treatment effects. One strategy is to assess the differences in posttest measures, between the intervention and control groups (Caliendo & Kopeinig, 2005). As detailed in Chapter 8, for the stratified risk groups (offending, educational disengagement and wellbeing risk), following the matching process, there were small pretest score differences between the intervention and control group on an isolated number of variables. Given this, there was a need to use the baseline measure of the outcome variable as a statistical control, and a regression based statistical approach was applied. Studies indicate that the use of regression modelling reduces the potential bias of outcome analyses (Oakes & Feldman, 2001), and the use of this approach was matched to an evaluation by Eisner, Nagin, Ribeaud, and Malti (2012) where the authors applied propensity score matching to evaluate the effectiveness of a parenting program. Outcome analyses for scale variables were conducted with multiple regression (SPSS v.20), with standardised Beta (β) reported. Outcome analyses for dichotomous variables were conducted with logistic regression (SPSS v.20), with the odds ratio (OR) reported. The equation for the outcome analyses is represented as:

$$Y = \alpha + \beta_1 X + \beta_2 T + \varepsilon$$

Where Y is the posttest score on the outcome variable, α is the estimated intercept, X is the pretest score on the same variable, and T is an (0,1) indicator for the treatment or control group. Intervention effects were assessed as the difference in treatment and control

groups, conditional on the pretest score, with the analyses weighted on the propensity score weighting variable as produced by the Propensity Score Matching Dialogue (V 3.0.2) developed by Thoemmes (2011). Pooled parameter estimates, across the 20 MI data sets, are reported in Chapter 8.

7.3.6.1 Threats to Internal and External Validity of Outcome Analysis

There are a number of potential threats to the internal and external validity of the outcome analyses reported in Chapter 8. They are discussed in turn.

The first threat relates to the YRB-MTC and TRP-MTC factors and the PSM modelling. Motivation to change scores were calculated on items where a behaviour was reported as present by a young person (YRB-MTC) or when the behaviour was reported as a problem by an observing teacher (TRP-MTC). Therefore, pretest-posttest outcome analyses specific to the MTC factors (only) were restricted to situations where one or more behaviour (or problem) was reported as present by a young person (or teacher) at both the pretest and posttest. Cases were therefore excluded from the analyses where one or more behaviour (or problem) was reported as present at the pretest, but was not present at the posttest (and vice versa). There are two implications of this restriction. First, the external validity of the analyses specific to motivation to change is restricted to young people presenting with behaviours (or problems) in both the pretest and posttest. Second, it raises a potential threat to the internal validity of the analyses. Through the exclusion of participants within the analysis, it is possible that the Operation Flinders and control groups may become non-equivalent, given the PSM models were developed prior to participants being excluded. It was beyond the scope of this research for PSM models to be developed for each MTC outcome measure to control for this potential confound, or for detailed balance statistics to be reported for the retained participant group specific to each MTC variable. Instead, independent t-tests were calculated to assess whether or not there were small effect size

differences between the pretest means of the Operation Flinders and control group for individual MTC factor measures. Where significant differences between pretest Operation Flinders and control group scores were identified, outcome analyses are not reported in Chapter 8. For reasons noted, equivalency between the Operation Flinders and control group participants cannot be accurately assessed nor guaranteed for MTC measures in Chapter 8. The reporting of results specific to the MTC measures should be made with this caveat.

The internal validity of the longer-term educational outcomes warrants comment on two grounds. First, a confound impacting on the internal validity of the longer-term measures is program timing. The 2013 and 2014 educational measures tap discrete assessment points, which do not align to the same pre- and post-program monitoring periods across the five waves of program intervention (ranging from March to September 2013). However, as shall be noted in the subsequent chapter, program timing was a covariate that demonstrated balance (e.g., there were no significant differences between the Operation Flinders and control groups in the matched samples). For this reason, a strong argument can be made that “program timing” as a confounding variable has been suitably controlled within the outcome analyses.

A second confound impacting on the internal validity of the longer-term educational outcome measures is whether or not a young person left school within 12 months of the completion of the intervention. In Chapter 8, four pre- and post-program outcome measures are reported: (1) School Attendance Rate, (2) School Unexplained Absences, (3) School Explained Absences and (4) School Suspension/Exclusion (DECD). As previously detailed (Section 7.3.3), missing values were imputed for all 2014 post-program measures and cases, including cases where participants left school within 12 months of the completion of the Operation Flinders program. The rationale for this complete imputation was made on the basis that 2014 behavioural data were provided for 60% of cases where young people had left

school within 12 months. The researcher considered two ways to address this confound. First, to remove cases where young people had left school in the 12 months following the completion of the Operation Flinders program. The associated loss of statistical power through reduced sample size did not support the use of this control. Second, to include the variable “left school within 12 months” as a predictor within the regression-based analyses specific to the attendance and behavioural outcomes. However, given the relatively small sample size of the study (in particular for the stratified risk groups), sufficient statistical power to support the inclusion of additional predictors did not meet recognised benchmarks (Ioannidis et al., 2014). Therefore, the outcome analyses reported in the next chapter specific to (1) School Attendance Rate, (2) School Unexplained Absences, (3) School Explained Absences and (4) School Suspension/Exclusion (DECD) do not directly statistically control for the confound related to whether or not a young person left school in the post-program period. However, given across all PSM models reported in Chapter 8, post-matching balance was achieved for the four educational variables previously stated, a strong argument can be made that this potential confound has been indirectly controlled as there is a strong conceptual relationship between leaving school and school attendance and behaviour.

In summary, despite the processes to address the noted confounds, there continues to be uncertainty in terms of the internal validity of the longer-term outcome measures employed within this research. For this reason, interpretations specific to the longer-term measures should be described as “indicative trends”.

7.3.7 Effect Size Reporting

Throughout this thesis, attention has been drawn to effect size reporting. There is increasing interest for researchers and program evaluators to move beyond significance testing reporting as the benchmark to assess program effectiveness (Kelley & Preacher, 2012). Sole reliance on this reporting has the potential lead to ill-founded policy and program

development initiatives and “researchers and policymakers alike should be careful about embracing null or small findings” (McCartney & Rosenthal, 2000, p. 180). Effect size reporting is now widely advocated and benchmarked in the literature (Kelley & Preacher, 2012; Olejnik & Algina, 2000). The outcome statistics applied within the current research are measures of effect size. That is, Standardised Beta (β) represents a strength of association, and can be interpreted in a similar manner as r (Ferguson, 2009). Odds ratio (OR) is a measure of risk estimate; a standardised measure of effect.

The interpretation of effect sizes reported within Chapter 8 requires a high degree of care because of the wide ranging definitions and benchmarking of effect size within the literature. This research defines effect size as the “quantitative reflection of the magnitude of some phenomenon that is used for the purpose of addressing a question of interest” (Kelley & Preacher, 2012, p. 140). This definition brings focus to the relationship between effect size and the specific variable, context and discipline in examination. Widely cited benchmarks of effect size (e.g., Cohen, 1988²⁵) do not nuance effect size for the specific content or question of interest. For example, within applied psychology, there are differences in effect size benchmarks between behaviour and attitudes (Bosco, Aguinis, Singh, Field, & Pierce, 2015). Bosco et al. (2015) reported that the effect size benchmarks reported by Cohen (1988) “present unrealistically high values for the applied psychology research context” (p. 441). In particular, Bosco et al. argued that distributions from applied psychology research indicate that small, medium and large effect size thresholds are one-half to one-third of those first proposed by Cohen (1988). However, other commentators have suggested that benchmarks for assessing the practical significance of social science data should be raised above Cohen’s conventions (Ferguson, 2009). For instance, outcomes are “practically” significant when $\beta > 0.2$ and the OR > 2.0 (Ferguson, 2009, p. 533).

²⁵ Applying Cohen’s conventions, small, medium and large for r (equivalent to β) is 0.1, 0.3, 0.5, respectively.

While noting the aforementioned, this research applies Cohen's (1988) benchmarks to interpret effect size. This is made for two reasons. First, when a new area of investigation is occurring (e.g., assessing motivation to change), where there are no pre-existing effect size estimates, it is recommended that Cohen's conventions are applied to aid interpretation (Vacha-Haase & Thompson, 2004). Second, the use of Cohen's benchmarks supports comparisons between results of this research and broader meta-analytic reviews of treatment effects across offending, educational and wellbeing contexts. Meta-analyses frequently apply Cohen's conventions to interpret effect sizes.

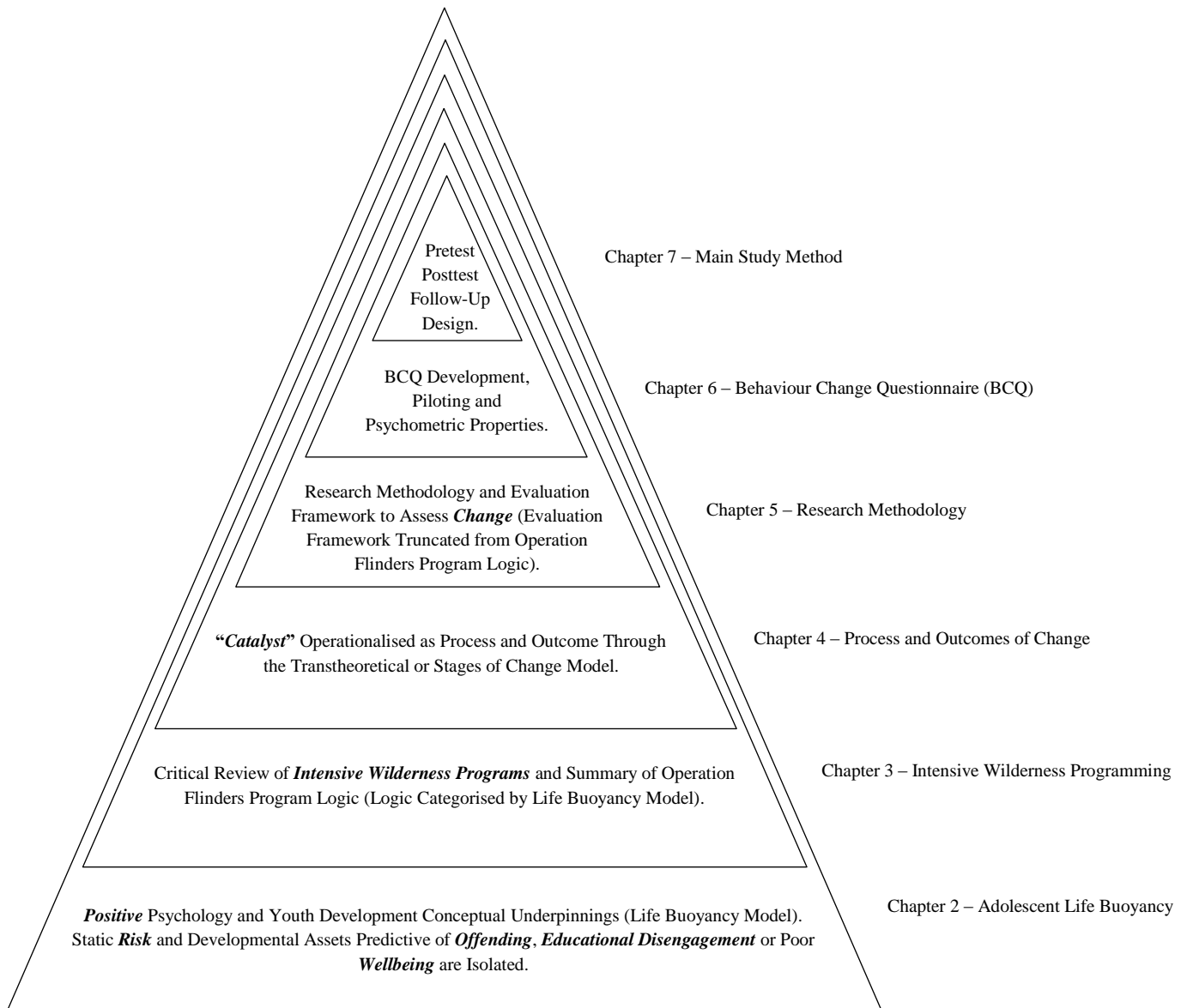
7.4 Chapter Summary

This chapter has detailed the methodology and instrumentation specific to the main and follow-up studies. It has also provided a detailed summary of the data management steps, and how significant attention has been paid to addressing non-equivalence between the treatment and control conditions, and strengthening the internal validity of the outcome analyses through propensity score matching. Chapter 8 identifies the strengths and weaknesses of each PSM model and provides the results of the outcome analyses specific to the research question and hypotheses.

Chapter 8

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
 Chapter 9 – Discussion
 Chapter 10 - Conclusions



8 Main Study Results

This chapter provides the results of the main study, responding to the research question: Can intensive wilderness programs be a catalyst for positive change for young people at risk of future offending, educational disengagement or poor wellbeing?

The chapter presents analyses stratified for five groups: (1) entire sample (PSM with replacement), (2) entire sample (PSM without replacement), (3) offending risk group, (4) educational disengagement risk group and (5) wellbeing risk group. The development and summary balance statistics of each PSM model are also provided in this chapter.

8.1 Hypotheses and Data Navigation

This chapter provides multiple statistical tables that present data specific to the research question and hypotheses. Table 8.1 is provided to support the reader to navigate the reported results as they relate to the two research hypotheses. This table summarises all outcome variables, and categorises them under the conceptual domains of (1) offending, (2) educational disengagement and (3) wellbeing. Table 8.1 also aligns each variable to the corresponding research hypothesis. The note section at the bottom of the table alerts the reader to important considerations that relate to the interpretation of individual variables. These points are consolidated from the previous chapters.

Table 8.1

Research Hypotheses and Outcome Variables

	Hypothesis 1 (Outcome of Change)	Hypothesis 2 (Process of Change)
	Young people undertaking the Operation Flinders program, with static risk factors predictive of future offending, educational disengagement or poor wellbeing, have higher levels of functioning on measures conceptually related to these outcomes, compared to matched young people with the same risk profile who are not exposed to the Operation Flinders program.	Young people undertaking the Operation Flinders intervention, with static risk factors predictive of future offending, educational disengagement or poor wellbeing, have greater motivation to make changes in behaviours indicative of educational disengagement, compared to matched young people with the same risk profile who are not exposed to the Operation Flinders intervention.
Offending Domain	(1) Offending Frequency (2) Identification with Criminal Others (3) Attitudes to Police (4) Aggressive Impulses	
Wellbeing Domain	(1) Alcohol Consumption Frequency (2) Intrinsic Value Orientation (3) Extrinsic Value Orientation (4) Self-Efficacy (5) Self-Esteem (6) Optimism ^a (7) Satisfaction with Life	
Educational Disengagement Domain	(1) Truancy Frequency (2) Attitudes to Teachers (3) Aspire to Complete Year 12 (4) Educational Risk Taking (5) Behavioral Academic Self-Esteem (BASE) (6) BASE - Student Initiative (7) BASE - Social Attention, (8) BASE - Success-Failure (9) BASE - Social Attraction (10) BASE - Self-Confidence (11) Youth Report Behaviours (YRB) - Total (12) YRB - Classroom Avoidance (13) YRB - Externalising Behaviours (14) YRB - Mental Absence ^a (15) Teacher Reported Problems (TRP) – Total (16) TRP - School and Classroom Avoidance (17) TRP - Work Avoidance (18) TRP - Interpersonal Problems. (longer-term outcomes) 1) School Suspension/Exclusion (DECD) ^b (2) School Unexplained Absences ^b (3) School Explained Absences ^b (4) School Attendance Rate (%) ^b (5) Left School Within 12 Months (%) ^b	(1) YRB-MTC – Total ^d (2) YRB-MTC - Classroom Avoidance ^c (3) YRB-MTC - Externalising Behaviours ^c (4) YRB-MTC - Mental Absence ^c (5) TRP-MTC – Total ^d (6) TRP-MTC - School and Classroom Avoidance ^c (7) TRP-MTC - Work Avoidance ^c (8) TRP-MTC - Interpersonal Problems ^c (9) Youth Problem Awareness (YPA)

Note: ^aTwo-item factor demonstrating fair internal consistency. ^bVariable measured at discrete 2013 and 2014 monitoring periods, not aligned to specific pre- and post-program assessment periods. Outcome analyses should be interpreted as “indicative trends”. ^cPossible confounding of behavioural type and motivation level, and scores should be interpreted as a “generalised” measure of motivation to change (see Section 6.3.7). ^dThis measure strongly confounds behaviour and motivation. Measure is reported in this chapter for exploratory purposes.

This chapter presents over 200 outcome analyses, and the risk of a Type 1 error being reported is high. While a Bonferroni correction is often recommended, this chapter will show that no statistically significant program effects were found on any outcome variable. For the reasons discussed in Chapter 7 (see Section 7.3.7), this chapter provides a descriptive narrative to all results that represent a small effect size ($\beta > .01$). A small pattern of differential improvements, in favour of the Operation Flinders cohort, was found with the offending risk group specific to behavioural outcomes. While this chapter provides some optimism that small program effects were present, the study lacked sufficient power (e.g., small group sample size) to rule out Type 1 errors for these small effects. This is discussed further in Chapter 9.

8.2 Entire Sample

The entire sample included 345 Operation Flinders and 209 control group participants. As detailed in Chapter 7, prior to conducting the outcome analyses, a PSM model was developed through a two-step process. First, a propensity score (the likelihood of receiving the treatment) was computed for each participant, using 71 covariates (covariates are defined in Table Z.1)²⁶. In step two, control and treatment participants were matched employing nearest neighbour 1:1 matching. Under this algorithm, a control participant can either be used only once as a match (*without replacement*), or it can be put back into the pool for further matching (*with replacement*). It is widely recommended that both approaches are applied, and results that demonstrate consistency across matching processes are considered robust in nature (Monahan et al., 2011). For this reason, separate PSM models were conducted using both the *with* and *without replacement* conditions.

²⁶ In this chapter, covariates that were included as predictors in the separate PSM models are referred to as “PSM predictors”. The 71 covariates that were applied to assess the matching balance between the Operation Flinders and control group are referred to as “balance covariates”. In the case of the two entire sample PSM models (with and without replacement), the PSM predictors and balance covariates represent the same 71 variables.

8.2.1 Entire Sample - PSM With Replacement

This section presents the development of the PSM model (with replacement) for the entire sample, followed by the pre- and post-matching balance statistics and the outcome analyses.

8.2.1.1 Development and Pre- and Post-Matching Balance of PSM Model

The PSM model employed nearest neighbour 1:1 matching (*with replacement*) applying all 71 balance covariates or PSM predictors (variables are detailed in Table Y.1). A calliper width of .05 was applied, which is 0.2 of the standard deviation of the logit of the propensity score, as recommended by Austin (2011). Table 8.2 summarises the pre- and post-matching descriptive and balance statistics. The matched sample, as pooled across the 20 MI data sets, included 329 Operation Flinders and 117 control group participants. Approximately 4.7% and 44.1% of Operation Flinders and control group members (respectively) were discarded through the matching process. Given the low proportion of discarded Operation Flinders participants, external validity of the PSM modelling is supported. In contrast, as control group cases were used on multiple occasions (up to 5 times), sample variance has been reduced, and this remains the strongest limitation of this PSM model.

Table 8.2

Summary of Pre- and Post-Matching Descriptives - PSM With Replacement (Entire Sample)

	Pre-Matching		Post-Matching	
	OF	Control	OF	Control
Number of participants	345	209	329	117
Number of small standardised differences ($d > 0.2, \phi > 0.1$)		26		0
Number of statistically significant differences ($p < .05$)		23		0

The internal validity of evaluations is predicated on the intervention and control groups being equivalent. To assess matching balance (or equivalence), pre- and post-matching balance statistics (mean, SD, independent t-test or Chi Square) were computed for the 71 balance covariates, and the complete results can be found in Table Y.1 (Appendix Y). The comparative analyses are summarised in Table 8.1. In short, prior to matching, 26 covariates demonstrated a small standardised difference (or effect size), based upon Cohen's (1988) conventions, between the Operation Flinders and control groups. To illustrate, prior to matching, the Operation Flinders group had a higher proportion of males (69.0% to 57.4%, $\phi = 0.12$, $p < .01$), had higher rates of pre-program suspension (65.2% to 39.2%, $\phi = 0.25$, $p < .01$) and criminal conviction (22.1% to 12.4%, $\phi = 0.12$, $p < .05$), and were more likely to be living with both parents (59.2% to 48.4%, $\phi = 0.11$, $p < .01$). The Operation Flinders cohort also demonstrated more negative attitudes to police and teachers, had greater identification with criminal others, exhibited lower levels of educational risk taking, presented with more negative classroom behaviour (assessed by the BASE), demonstrated lower scores on the intrinsic and extrinsic value orientation subscales, and presented with a higher number of behaviours and problems indicative of educational disengagement, as assessed on the BCQ YRB and TRP measures. All of these differences were in the small to medium effect size range, and were statistically significant ($p < .05$) for 23 of the 71 measures.

Following the matching process, across the 71 variables, there were no effect size differences (e.g., $d > 0.2$) between the Operation Flinders and control group participant groups, nor were there any statistically significant differences on any of the 71 balance covariates. The matching process achieved equivalence across the two groups on the measured variables. It cannot be ruled out, however, that the matched samples may differ on an unmeasured covariate.

To illustrate the matching process, the propensity score distribution, specific to one MI data set, is provided in Figure 8.1 (as per output by Thoemmes, 2011; 2012). As expected, Figure 8.1 shows that the Operation Flinders group had higher propensity scores than the control group. However, following matching, the propensity score distribution of both groups was similar. A visual inspection of the SPSS Output indicated that this pattern was replicated across the 20 MI data sets, providing further support for post-matching group equivalence.

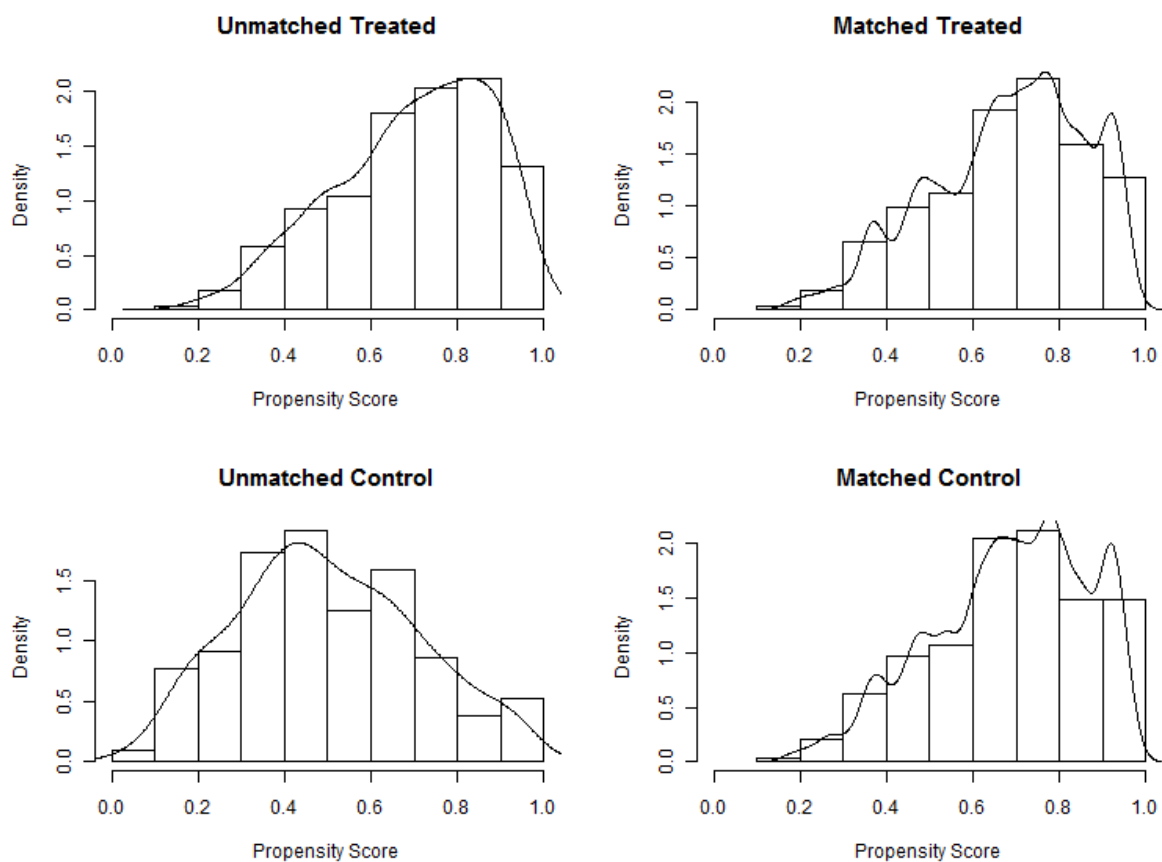


Figure 8.1 Propensity score distribution for Operation Flinders (treated) and control group for PSM with replacement

8.2.1.2 Entire Sample with Replacement Outcome Analyses

Table 8.3 summarises the pretest posttest descriptive statistics (mean, SD) and the regression-based measures (β and OR) specific to the short-term outcomes employed within the evaluation. Throughout this chapter, outcome measures (β and OR) indicative of desired level of improvement, in favour of the Operation Flinders group, are coded positively.

Table 8.3

*Short-Term Offending, Educational Engagement and Wellbeing Outcomes for Entire Sample
(PSM With Replacement)*

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^b / OR^c	<i>p</i> value
Truancy Frequency	Control	1.03	1.57	1.27	1.61	0.02 ^b	0.74
	OF	1.11	1.68	1.26	1.67		
Offending Frequency	Control	0.66	1.34	0.86	1.38	0.01 ^b	0.81
	OF	0.74	1.43	0.85	1.36		
Alcohol Consumption Frequency	Control	0.89	1.44	1.07	1.38	0.01 ^b	0.87
	OF	0.94	1.48	1.06	1.36		
Identification with Criminal Others	Control	12.42	3.35	12.57	3.42	0.04 ^b	0.44
	OF	12.43	3.70	12.26	3.52		
Attitudes to Police	Control	23.65	6.17	23.98	4.84	0.02 ^b	0.67
	OF	23.65	6.03	24.34	5.23		
Attitudes to Teachers	Control	22.66	5.27	22.74	4.82	0.04 ^b	0.37
	OF	23.02	4.89	23.42	4.61		
Aggressive Impulses	Control	21.40	8.22	20.72	8.75	0.05 ^b	0.32
	OF	21.28	8.39	19.62	8.27		
Self-Efficacy	Control	13.18	3.30	13.40	2.99	0.03 ^b	0.65
	OF	13.47	2.93	13.73	3.04		
Self-Esteem	Control	14.22	4.24	14.79	4.38	0.04 ^b	0.50
	OF	14.53	3.97	15.35	3.83		
Optimism	Control	6.65	1.90	6.54	1.69	0.09 ^b	0.11
	OF	6.72	1.64	6.92	1.73		
Intrinsic Value Orientation	Control	45.24	8.34	44.89	8.25	0.08 ^b	0.22
	OF	45.60	7.89	46.52	8.08		
Extrinsic Value Orientation	Control	25.89	7.63	26.09	7.73	0.05 ^b	0.28
	OF	26.25	7.48	25.33	8.46		
Satisfaction with Life	Control	14.51	5.12	14.86	4.76	0.01 ^b	0.90
	OF	14.78	4.48	15.08	4.34		
Aspire to Complete Year 12 (%)	Control	75.10	n/a	75.22	n/a	-1.26 ^c (0.50 to 3.20) ^a	0.62
	OF	70.11	n/a	69.41	n/a		
Educational Risk Taking	Control	15.21	4.11	16.58	4.55	0.04 ^b	0.51
	OF	14.82	4.54	16.78	4.28		
Behavioral Academic Self-Esteem (BASE)	Control	48.18	10.43	52.14	10.98	0.07 ^b	0.24
	OF	48.03	10.57	53.62	9.80		
BASE - Student Initiative	Control	18.00	4.37	19.13	4.96	0.11 ^b	0.09
	OF	17.90	4.49	20.16	4.28		
BASE - Social Attention	Control	9.38	2.58	10.38	2.50	0.01 ^b	0.88
	OF	9.39	2.53	10.43	2.24		
BASE - Success- Failure	Control	5.89	1.86	6.52	1.68	0.01 ^b	0.87
	OF	5.88	1.81	6.56	1.64		
BASE - Social Attraction	Control	8.83	2.40	9.38	2.23	0.06 ^b	0.33
	OF	8.78	2.42	9.66	2.22		
BASE - Self- Confidence	Control	6.07	1.70	6.72	1.61	0.03 ^b	0.62
	OF	6.07	1.63	6.81	1.52		

Note: ^aRange of 95% confidence interval for OR.

Table 8.3 shows that, for 19 of the 21 measures, Operation Flinders participants had greater improvements across the two measuring points. However, apart from the BASE-Student Initiative scale ($\beta = .11$, $p = .09$), no measure reached Cohen's (1988) conventions for small effect size, nor did any outcome reach statistical significance ($p > .09$).

Table 8.4 summarises the descriptive and outcome statistics for all scales specific to the Behavioural Change Questionnaire (Youth- and Teacher-Report). While there was a pattern of differential pretest posttest improvements in favour of the Operation Flinders group, only the YRB-MTC Mental Absence scale reached the cut-off for small effect size ($\beta > .10$), and all outcome measures were statistically non-significant ($p > .10$).

Table 8.4

Behavioural and Motivational Outcomes (BCQ) for Entire Sample (PSM With Replacement)

		Mean Pretest	SD Pretest	Mean Posttest	SD Posttest	β	p value
Youth Report Behaviours (YRB) - Total	Control	9.26	4.86	9.70	4.88	0.05	0.21
	OF	9.39	4.87	9.18	5.03		
YRB - Classroom Avoidance	Control	0.78	0.88	0.97	0.92	0.06	0.25
	OF	0.81	0.88	0.87	0.89		
YRB - Externalising Behaviours	Control	2.79	1.79	2.94	1.92	0.06	0.16
	OF	2.82	1.81	2.70	1.89		
YRB - Mental Absence	Control	1.58	0.67	1.54	0.68	0.02	0.75
	OF	1.55	0.70	1.49	0.69		
YRB Motivation to Change (MTC) - Total	Control	2.15	0.81	2.11	0.71	0.08	0.19
	OF	2.14	0.83	2.24	0.83		
YRB-MTC - Classroom Avoidance	Control	2.25 ^a	1.13	2.25	0.99	n/a	n/a
	OF	2.02 ^a	1.11	2.18	1.08		
YRB-MTC - Externalising Behaviours	Control	2.17	0.95	2.12	0.78	0.08	0.21
	OF	2.24	0.97	2.31	0.93		
YRB-MTC - Mental Absence	Control	2.07	1.00	2.06	0.95	0.10	0.10
	OF	2.06	1.00	2.27	1.03		
Teacher Report Problems (TRP) - Total	Control	7.31	4.81	6.58	4.98	0.05	0.31
	OF	7.98	4.70	6.44	4.45		
TRP - School and Classroom Avoidance	Control	0.96	1.13	0.97	1.16	0.03	0.58
	OF	1.09	1.18	0.95	1.11		
TRP - Work Avoidance	Control	2.28	1.56	1.94	1.52	0.07	0.23
	OF	2.47	1.51	1.82	1.45		
TRP - Interpersonal Problems	Control	1.38	1.52	1.26	1.48	0.02	0.69
	OF	1.50	1.48	1.25	1.38		
TRP Motivation to Change (MTC) - Total	Control	1.47	0.86	1.56	0.88	0.00	0.98
	OF	1.48	0.86	1.57	0.91		
TRP-MTC - School and Classroom Avoidance	Control	1.30	1.31	1.32	1.11	0.04	0.67
	OF	1.26	1.25	1.43	1.28		
TRP-MTC - Work Avoidance	Control	1.67	1.14	1.69	1.14	0.02	0.81
	OF	1.63	1.11	1.72	1.21		
TRP-MTC - Interpersonal Problems	Control	1.18	1.19	1.21	1.09	-0.01	0.92
	OF	1.29	1.13	1.25	1.22		
Youth Problem Awareness	Control	0.90	0.33	0.98	0.31	0.01	0.80
	OF	0.87	0.32	0.97	0.29		

Note: ^aSmall ($d > 0.20$), but non-significant difference, between pretest scores, $t(57) = 0.84$, $p > .05$, $d = 0.21$, therefore outcome result not reported (as per rationale provided in Section 7.3.6.1).

Table 8.5 summarises the descriptive and outcome statistics specific to the longer-term educational measures. This table shows that while the results demonstrated a pattern of differential improvements in favour of the control group, no outcome reached the cut-off for small effect size ($\beta > .10$, OR > 2.0), nor did any of the results reach statistical significance ($p > .18$).

Table 8.5

Longer-Term Educational Outcome Trends for Entire Sample (PSM With Replacement)

		Mean / % Pretest	SD Pretest	Mean / % Posttest	SD Posttest	β^f / OR ^g	p value
School Suspension/Exclusion (DECD) (%)	Control	21.75 ^a	n/a	8.36 ^b	n/a	0.97 ^g	0.96
	OF	24.73 ^a	n/a	8.31 ^b	n/a	(0.26 to 3.58) ^e	
School Unexplained Absences	Control	6.64 ^c	9.01	10.34 ^d	13.64	-0.01 ^f	0.85
	OF	7.71 ^c	10.62	11.28 ^d	14.53		
School Explained Absences	Control	10.49 ^c	9.13	10.20 ^d	9.92	-0.06 ^f	0.43
	OF	10.58 ^c	10.77	11.61 ^d	11.50		
School Attendance Rate (%)	Control	82.73 ^c	0.15	79.96 ^d	0.18	-0.07 ^f	0.21
	OF	81.33 ^c	0.17	76.06 ^d	0.22		
Left School Within 12 Months (%)	Control	n/a	n/a	12.96	n/a	-1.64 ^g	0.18
	OF	n/a	n/a	19.47	n/a	(0.79 to 3.42) ^e	

Note: ^aPretest measure corresponds to Term 2, 2013. ^bPosttest measure corresponds to Term 2, 2014. ^cPretest measure corresponds to Terms 1 and 2, 2013. ^dPosttest measure corresponds to Terms 1 and 2, 2014. ^eRange of 95% confidence interval for OR. ^fBeta (β). ^gOdds Ratio (OR)

In summary, for the full sample of participants, Operation Flinders program attendance was not associated with statistically significant positive outcomes on measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing, and increased motivation to change. Small, but non-significant, program effects were found on the behavioural expression of student initiative within the classroom setting, and motivation to change behaviours indicative of mental absence (day-dreaming and tiredness).

8.2.2 Entire Sample - PSM Without Replacement

This section presents the development of the PSM model (without replacement) for the entire sample, followed by the pre- and post-matching balance statistics and the outcome analyses.

8.2.2.1 Development and Pre- and Post-Matching Balance of PSM Model

The PSM model employed nearest neighbour 1:1 matching (*without replacement*) applying all 71 balance covariates as PSM predictors (variables are detailed in Table Y.2). A calliper width of .05 was applied. The matched sample included 141 participants in both the control and Operation Flinders groups. Approximately 32.6% and 59.2% of Operation Flinders and control group members were discarded through the matching process, respectively. A strength of the PSM *without replacement* model is that it maximises sample variance, however, this occurs at the expense of increased bias (Caliendo & Kopeinig, 2005). For example, as reported in Table Y.2, the matched sample, in comparison to the pre-matched Operation Flinders cohort, had a lower proportion of males, and participants with a criminal conviction, suspension and truancy history. This matched sample also exhibited a pattern of higher levels of functioning on measures conceptually related to reduced offending (e.g., lowered identification with criminal others), higher wellbeing (e.g., increased self-efficacy) and lowered rates of educational disengagement (e.g., lower YRB/TRP scores). Given this pattern, the generalisability of the results of the PSM without replacement model, across the entire Operation Flinders cohort, is not supported.

Table 8.6

Summary of Pre- and Post-Matching Descriptives - PSM Without Replacement (Entire Sample)

	Pre-Matching		Post-Matching	
	OF	Control	OF	Control
Number of participants	345	209	141	141
Number of small standardised differences ($d > 0.2, \phi > 0.1$)		26		0
Number of statistically significant differences ($p < .05$)		23		0

To assess matching balance (or equivalence), pre- and post-matching descriptive and balance statistics are reported in Table Y.2, and summarised in Table 8.6. As previously discussed in Section 8.2.1.1, prior to matching, 26 covariates demonstrated a small standardised difference (or effect size) across the Operation Flinders and control group, with the majority being statistically significant ($p < .05$). Following matching, across the 71 balance covariates, there were no effect size differences (e.g., $d > 0.2$) between the Operation Flinders and control group participant groups, nor were there any statistically significant differences. The matching process achieved equivalence across the two groups on the measured variables. It cannot be ruled out, however, that the matched samples may differ on an unmeasured covariate.

To illustrate the matching process, the propensity score distribution, specific to one MI data set, is provided in Figure 8.2²⁷.

²⁷ This chapter only reports the propensity score distribution for the entire PSM groups, matching *with* and *without replacement*. For the stratified groups (offending, educational disengagement and poor wellbeing), the propensity score distribution demonstrates greater variation across the individual 20MI data sets. For this reason visual inspection of an individual MI data set does not support a reliable assessment of equivalence between Operation Flinders and control group across the 20MI data sets. Instead, equivalency is assessed through post-matching covariate differences.

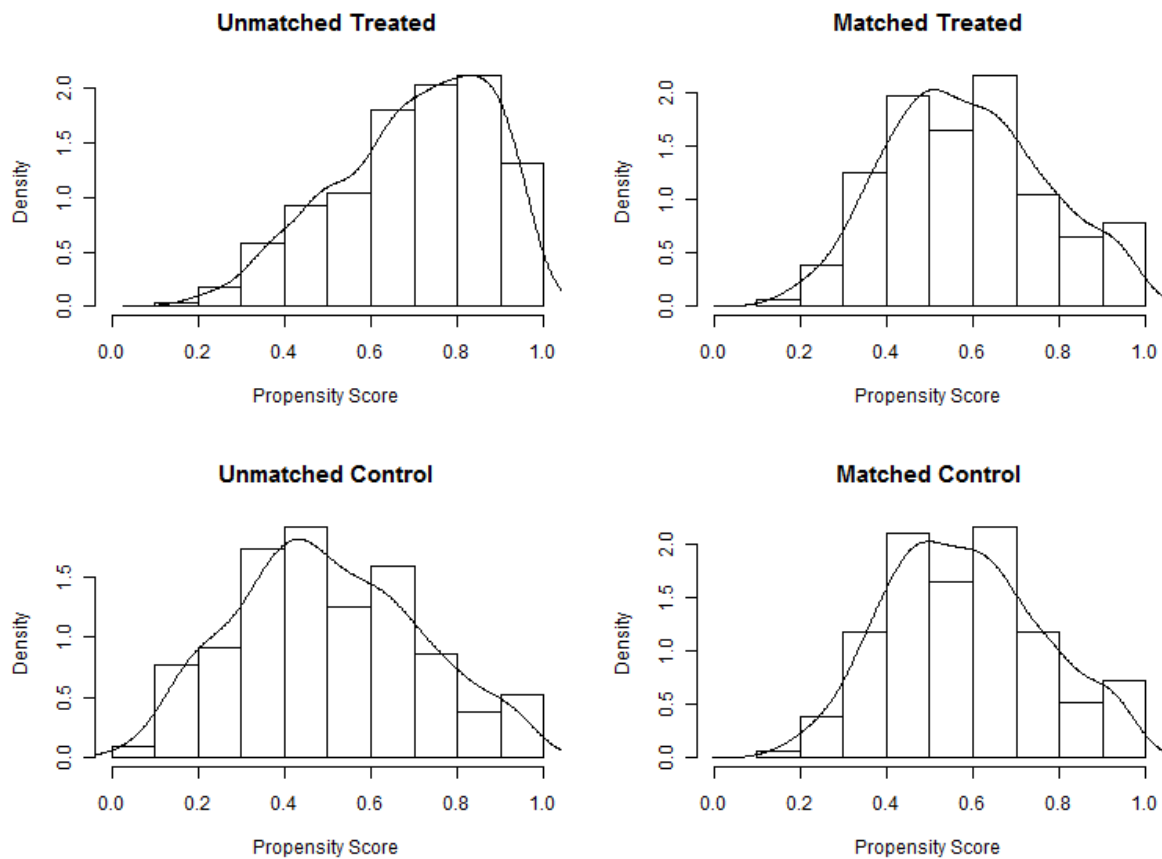


Figure 8.2 Propensity score distribution for Operation Flinders (treated) and control group for PSM without replacement

As expected, the Operation Flinders group demonstrated a pattern of higher propensity scores, however, following matching, the propensity score distributions of both groups were similar, and a visual inspection of the SPSS Output indicated that this pattern was replicated across the 20 MI data sets. As Figures 8.1 and 8.2 were generated from the same MI data set, their visual comparison provides an opportunity to review the matching *with* and *without replacement* conditions. The matched distributions in Figure 8.1 demonstrate negative skewing, while the matched distribution in Figure 8.2 exhibits a normally distributed pattern. In other words, the PSM without replacement condition has led to Operation Flinders participants with the highest propensity scores (i.e., with the higher risk factors) being more likely to be discarded.

8.2.2.2 *Entire Sample Without Replacement Outcome Analyses*

Table 8.7 summarises the pretest posttest descriptive statistics (mean, SD) and the regression-based measures (β and OR) specific to the short-term outcomes employed within the evaluation. While there was a consistent pattern of differential improvements in favour of the Operation Flinders cohort, no outcome measure reached Cohen's (1988) conventions for small effect size, nor did any outcome reach statistical significance ($p > .09$).

Table 8.8 summarises the descriptive and outcome statistics for all measures relating to the Behavioural Change Questionnaire (Youth- and Teacher-Report). Again, while there was a pattern of differential pretest posttest improvements in favour of the Operation Flinders group, only the TRP-MTC Work Avoidance scale reached the cut-off for small effect size ($\beta > .10$), and no dependent variable reached statistical significance ($p > .10$).

Table 8.7

Short-Term Offending, Educational Engagement and Wellbeing Outcomes for Entire Sample (PSM Without Replacement)

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^b / OR^c	<i>p</i> value
Truancy Frequency	Control	0.90	1.47	1.19	1.55	0.04 ^b	0.47
	OF	0.91	1.52	1.07	1.57		
Offending Frequency	Control	0.56	1.19	0.76	1.27	0.04 ^b	0.59
	OF	0.60	1.25	0.69	1.22		
Alcohol Consumption Frequency	Control	0.83	1.34	1.03	1.27	0.04 ^b	0.48
	OF	0.82	1.33	0.91	1.22		
Identification with Criminal Others	Control	11.98	3.35	12.00	3.48	0.03 ^b	0.62
	OF	11.96	3.61	11.76	3.36		
Attitudes to Police	Control	24.79	5.41	24.95	4.73	0.02 ^b	0.73
	OF	24.87	5.68	25.32	4.96		
Attitudes to Teachers	Control	23.66	4.73	23.59	4.68	0.06 ^b	0.34
	OF	23.61	4.76	24.09	4.67		
Aggressive Impulses	Control	20.43	8.08	19.68	8.47	0.06 ^b	0.37
	OF	20.49	8.04	18.76	8.07		
Self-Efficacy	Control	13.73	3.10	13.69	3.05	0.05 ^b	0.35
	OF	13.66	2.97	13.97	2.96		
Self-Esteem	Control	14.42	4.20	14.97	4.12	0.05 ^b	0.42
	OF	14.42	4.07	15.38	3.85		
Optimism	Control	6.79	1.75	6.74	1.64	0.09 ^b	0.17
	OF	6.81	1.60	7.06	1.67		
Intrinsic Value Orientation	Control	46.89	7.26	46.42	7.69	0.05 ^b	0.36
	OF	46.80	7.40	47.22	7.67		
Extrinsic Value Orientation	Control	26.91	7.55	26.73	7.93	0.08 ^b	0.16
	OF	26.78	7.23	25.30	8.52		
Satisfaction with Life	Control	15.17	4.90	15.53	4.63	0.01 ^b	0.93
	OF	15.15	4.36	15.56	4.26		
Aspire to Complete Year 12 (%)	Control	74.65	n/a	76.57	n/a	1.09 ^c (0.43 to 2.79) ^a	0.85
	OF	75.04	n/a	77.32	n/a		
Educational Risk Taking	Control	16.09	4.41	17.12	4.44	0.04 ^b	0.51
	OF	16.01	4.48	17.46	4.39		
Behavioral Academic Self-Esteem (BASE)	Control	50.47	11.23	54.35	10.40	0.05 ^b	0.38
	OF	50.46	10.47	55.36	10.09		
BASE - Student Initiative	Control	18.87	4.63	20.18	4.59	0.07 ^b	0.25
	OF	18.89	4.45	20.82	4.41		
BASE - Social Attention	Control	9.91	2.62	10.67	2.41	0.03 ^b	0.61
	OF	9.88	2.51	10.79	2.25		
BASE - Success- Failure	Control	6.18	1.91	6.83	1.62	-0.02 ^b	0.73
	OF	6.19	1.70	6.76	1.65		
BASE - Social Attraction	Control	9.18	2.49	9.80	2.27	0.04 ^b	0.57
	OF	9.17	2.46	9.97	2.27		
BASE - Self- Confidence	Control	6.33	1.77	6.86	1.58	0.05 ^b	0.50
	OF	6.33	1.62	7.00	1.50		

Note: ^aRange of 95% confidence interval for OR.

Table 8.8

Behavioural and Motivational Outcomes (BCQ) for Entire Sample (PSM Without Replacement)

		Mean Pretest	SD Pretest	Mean Posttest	SD Posttest	β	p value
Youth Report Behaviours (YRB) - Total	Control	8.45	5.07	9.08	5.18	0.07	0.13
	OF	8.49	5.06	8.35	5.20		
YRB - Classroom Avoidance	Control	0.72	0.88	0.92	0.92	0.08	0.19
	OF	0.73	0.88	0.78	0.89		
YRB - Externalising Behaviours	Control	2.41	1.87	2.61	1.95	0.06	0.22
	OF	2.41	1.89	2.36	1.96		
YRB - Mental Absence	Control	1.53	0.71	1.52	0.70	0.04	0.51
	OF	1.53	0.71	1.47	0.70		
YRB Motivation to Change (MTC) - Total	Control	2.18	0.83	2.13	0.77	0.09	0.20
	OF	2.16	0.85	2.27	0.85		
YRB-MTC - Classroom Avoidance	Control	2.25	1.10	2.21	1.00	0.04	0.72
	OF	2.26	1.12	2.29	1.10		
YRB-MTC - Externalising Behaviours	Control	2.20	0.93	2.15	0.82	0.08	0.41
	OF	2.28	0.98	2.31	0.93		
YRB-MTC - Mental Absence	Control	2.16	1.00	2.18	0.98	0.09	0.23
	OF	2.10	1.01	2.33	1.05		
Teacher Report Problems (TRP) - Total	Control	7.04	5.12	5.96	4.85	0.05	0.44
	OF	7.08	4.76	5.56	4.40		
TRP - School and Classroom Avoidance	Control	1.00	1.17	0.88	1.13	0.04	0.50
	OF	1.01	1.14	0.80	1.04		
TRP - Work Avoidance	Control	2.14	1.57	1.74	1.52	0.05	0.39
	OF	2.14	1.54	1.59	1.44		
TRP - Interpersonal Problems	Control	1.30	1.50	1.13	1.38	0.02	0.77
	OF	1.31	1.44	1.08	1.34		
TRP Motivation to Change (MTC) - Total	Control	1.43	0.87	1.48	0.94	0.03	0.68
	OF	1.42	0.89	1.53	0.92		
TRP-MTC - School and Classroom Avoidance	Control	1.23	1.30	1.27	1.20	0.04	0.73
	OF	1.29	1.33	1.40	1.34		
TRP-MTC - Work Avoidance	Control	1.58	1.15	1.45	1.16	0.11	0.18
	OF	1.52	1.14	1.68	1.69		
TRP-MTC - Interpersonal Problems	Control	1.14	1.13	1.17	1.11	-0.03	0.80
	OF	1.20	1.18	1.14	1.22		
Youth Problem Awareness	Control	0.90	0.33	0.99	0.31	0.02	0.79
	OF	0.90	0.31	1.00	0.28		

Table 8.9 summarises the descriptive and outcome statistics specific to the longer-term behavioural measures. There was no consistent pattern of differential improvements in favour of the Operation Flinders or control group. Furthermore, no outcome reached the cut-off for small effect size ($\beta > .10$, $OR > 2.0$), nor did the analyses reach statistical significance ($p > .24$).

Table 8.9

Longer-Term Educational Outcome Trends for Entire Sample (PSM Without Replacement)

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^f / OR^g	<i>p</i> value
School Suspension/Exclusion (DECD) (%)	Control	19.69 ^a	n/a	7.86 ^b	n/a	1.22 ^g	0.78
	OF	19.79 ^a	n/a	6.80 ^b	n/a	(0.29 to 5.18) ^e	
School Unexplained Absences	Control	6.62 ^c	8.96	11.14 ^d	14.38	0.01 ^f	0.84
	OF	6.52 ^c	9.35	10.65 ^d	14.27		
School Explained Absences	Control	10.65 ^c	9.58	9.85 ^d	9.54	-0.05 ^f	0.44
	OF	10.74 ^c	11.88	10.95 ^d	11.11		
School Attendance Rate (%)	Control	82.72 ^c	0.15	79.50 ^d	0.18	-0.05 ^f	0.44
	OF	82.68 ^c	0.17	77.43 ^d	0.21		
Left School Within 12 Months (%)	Control	n/a	n/a	14.02	n/a	-1.54 ^g	0.24
	OF	n/a	n/a	20.04	n/a	(0.75 to 3.14) ^e	

Note: ^aPretest measure corresponds to Term 2, 2013. ^bPosttest measure corresponds to Term 2, 2014. ^cPretest measure corresponds to Terms 1 and 2, 2013. ^dPosttest measure corresponds to Terms 1 and 2, 2014. ^eRange of 95% confidence interval for OR. ^fBeta (β). ^gOdds Ratio (OR).

In summary, for the full cohort of participants within the PSM *without replacement* model, Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing and motivation to change. A small, but non-significant, program effect was found on the measure assessing motivation to change specific to teacher-reported problems associated with work avoidance in educational settings.

8.3 Offending Risk Group

The offending risk group isolates Operation Flinders and control group members who reported breaking the law on one or more occasion in the month prior to the start of the Operation Flinders program, or had a pre-program criminal conviction (youth-reported).

8.3.1 Development and Pre- and Post-Matching Balance of PSM Model

In the first iteration of the PSM model development, nearest neighbour 1:1 matching (*with replacement*) was applied using all 71 balance covariates as PSM predictors. This resulted in many Operation Flinders and control group participants being discarded, and the final matched sample included a number of small to medium between group differences across the balance covariates. In addition to the discards being a threat to the model's internal validity, the reduced sample size restricted the statistical power of the outcome analyses and raised concerns regarding external validity. As recommended by Caliendo and Kopeinig (2005), the number of PSM predictors was reduced. A final set of 29 predictors was settled on for the final model. These were chosen based upon their conceptual and predictive relationship with future offending (with reference to Table 2.1, Chapter 2). These included: age, sex, SES, reading level, aspiration for future, rural versus city, level of family support, criminal conviction history, history of at-risk behaviour (truancy, suspension, exclusion and alcohol consumption), recent aggression, criminal cognitions and attitudes, behaviour within the classroom and current behaviours indicative of educational disengagement. The complete list of PSM predictors is detailed in Table Y.3.

To improve matching quality, a calliper width of .05 was applied, in line with recommended guidelines by Austin (2011) and as discussed in detail in Section 7.3.5. The matched sample, as pooled across the 20 MI data sets, included 82 Operation Flinders and 31 control group participants (see Table 8.10). Approximately 37.9% and 50.9% of Operation Flinders and control group members were discarded through matching. Given the relatively

high number of discarded Operation Flinders participants, external validity warrants critical review. Detailed descriptive and balance statistics for all 71 balance covariates can be found in Table Y.3. A comparison of pre- and post-matching scores for the Operation Flinders group found no consistent pattern of differences across the 71 predictors. For example, while pre-program criminal conviction was reduced through matching (from 57.7% to 51.2%), the number of young people who reporting breaking the law in the post-matched sample was marginally higher compared to the pre-matched sample (79.6% to 74.5%). While external validity is supported, loss of variance through a high number of discarded control group members (50.9%) and multiple use of control members within matching (up to 8 occasions), remains a limitation of this model.

Table 8.10

Summary of Pre- and Post-Matching Descriptives - PSM With Replacement (Offending Risk Group)

	Pre-Matching		Post-Matching	
	OF	Control	OF	Control
Number of participants	132	61	82	31
Number of small standardised differences ($d > 0.2$, $\phi > 0.1$) across all 71 covariates		15		11
Number of statistically significant differences ($p < .05$) across all 71 covariates		0		0
Number of small standardised differences ($d > 0.2$, $\phi > 0.1$) across 29 PSM predictors		6		1

As summarised in Table 8.10, prior to matching, 15 out of the 71 balance covariates demonstrated a small standardised difference (or effect size) across the Operation Flinders and control groups, with 6 out of the 29 covariates functioning as PSM predictors, and having

a conceptual and predictive relationship with future offending. None of these differences were statistically significant ($p > .05$).

Following the matching process, 11 of the 71 balance covariates exhibited small effect size differences between the Operation Flinders and control groups. One of these covariates, BCQ TRP Interpersonal Problems, also functioned as a PSM predictor. The control group demonstrated higher levels of interpersonal problems ($M = 2.22$, $SD = 1.60$) compared to the Operation Flinders group ($M = 1.87$, $SD = 1.51$), however, this difference was statistically non-significant, $t(66) = 0.78$, $p > .05$, $d = 0.22$. Collectively, improved balance has been achieved through the matching process for the following reasons. First, there was a reduction (from 15 to 11) in the number of balance covariates exhibiting standardised differences (e.g., $d > .20$) between the matched samples. Second, only one PSM predictor, which has a strong conceptual relationship with offending, exhibited a small standardised difference in the post-matched sample and this was within the range of chance (less than 5% of total number of PSM predictors). While it cannot be concluded that the post-matched Operation Flinders and control group samples are completely identical, their equivalency across the PSM predictors that have a conceptual and predictive relationship with future offending supports the use of this PSM model within the current analyses.

8.3.2 Offending Risk Group Outcome Analyses

Table 8.11 summarises the pretest and posttest descriptive statistics (mean, SD) and the regression-based measures (β and OR) specific to the short-term outcomes employed within the evaluation. There were differential improvements in favour of the Operation Flinders participants on 20 of the 21 outcome measures. While five of these measures met Cohen's (1988) conventions for small effect size ($\beta > .10$), none of the outcomes were statistically significant ($p > .10$).

Table 8.11

Short-Term Offending, Educational Engagement and Wellbeing Outcomes for Offending Risk Group (PSM With Replacement)

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^b / OR ^c	<i>p</i> value
Truancy Frequency	Control	1.46	1.67	1.80	1.72	0.05 ^b	0.57
	OF	1.79	1.83	1.78	1.75		
Offending Frequency	Control	1.97	1.58	1.81	1.66	0.09 ^b	0.44
	OF	1.98	1.61	1.47	1.59		
Alcohol Consumption Frequency	Control	2.08	1.84	2.50	1.66	0.17 ^b	0.10
	OF	1.83	1.72	1.73	1.59		
Identification with Criminal Others	Control	13.56	3.17	13.63	3.48	0.04 ^b	0.73
	OF	14.02	3.65	13.45	3.62		
Attitudes to Police	Control	22.49	5.29	23.66	5.14	0.06 ^b	0.59
	OF	21.69	6.06	23.51	5.45		
Attitudes to Teachers	Control	22.49	5.32	22.56	5.18	0.07 ^b	0.56
	OF	22.44	5.07	23.29	4.78		
Aggressive Impulses	Control	25.32	8.20	24.13	9.11	0.10 ^b	0.43
	OF	24.38	8.27	21.69	8.52		
Self-Efficacy	Control	13.89	3.17	13.16	3.46	0.11 ^b	0.35
	OF	13.03	3.00	13.53	3.07		
Self-Esteem	Control	14.45	4.16	14.90	4.77	0.01 ^b	0.96
	OF	14.18	4.16	14.81	4.21		
Optimism	Control	6.68	1.60	6.70	1.78	0.04 ^b	0.79
	OF	6.46	1.71	6.73	1.76		
Intrinsic Value Orientation	Control	47.43	6.30	46.92	6.53	0.04 ^b	0.73
	OF	45.32	7.52	46.70	7.79		
Extrinsic Value Orientation	Control	30.86	6.96	30.12	7.94	0.07 ^b	0.59
	OF	27.57	7.32	26.95	8.51		
Satisfaction with Life	Control	15.08	4.83	15.06	4.35	0.03 ^b	0.80
	OF	14.14	4.75	14.26	4.58		
Aspire to Complete Year 12 (%)	Control	58.79	n/a	65.34	n/a	-1.86 ^c (0.32 to 10.60) ^a	0.48
	OF	58.95	n/a	56.86	n/a		
Educational Risk Taking	Control	14.30	4.01	15.63	4.24	0.05 ^b	0.70
	OF	13.40	4.14	15.82	4.15		
Behavioral Academic Self- Esteem (BASE)	Control	45.49	10.28	50.24	9.38	0.07 ^b	0.63
	OF	45.57	10.05	51.57	8.53		
BASE - Student Initiative	Control	16.94	4.45	19.04	3.89	0.04 ^b	0.79
	OF	16.92	4.15	19.33	3.60		
BASE - Social Attention	Control	8.25	2.48	9.09	2.27	0.14 ^b	0.26
	OF	8.75	2.57	9.95	2.11		
BASE - Success-Failure	Control	5.30	1.90	6.15	1.76	0.06 ^b	0.61
	OF	5.67	1.78	6.44	1.67		
BASE - Social Attraction	Control	9.21	2.25	9.69	2.08	0.04 ^b	0.77
	OF	8.60	2.47	9.30	2.22		
BASE - Self-Confidence	Control	5.80	1.59	6.27	1.40	0.10 ^b	0.45
	OF	5.62	1.65	6.55	1.44		

Note: ^aRange of 95% confidence interval for OR.

Small effect size outcomes were demonstrated in reduced alcohol consumption frequency ($\beta = .17, p = .10$) and aggressive impulses ($\beta = .10, p = .43$), and improvements in generalised self-efficacy ($\beta = .11, p = .35$), and behaviourally expressed self-confidence ($\beta = .10, p = .45$) and social attention ($\beta = .14, p = .26$) within the classroom environment, as assessed by teachers. It should be noted, however, the small effects noted for the alcohol consumption and generalised self-efficacy measures were, in part, attributable to deteriorations in control group across the two measuring points.

Table 8.12 provides the descriptive and outcome statistics relating to all measures specific to the Behavioural Change Questionnaire (Youth- and Teacher-Report). There was a pattern of pretest to posttest improvements, in favour of the Operation Flinders group, for all behavioural measures, as operationalised through the YRB and TRP scales. Effects that reached Cohen's (1992) conventions for small effect size included YRB-Total ($\beta = .11, p = .26$), TRP-Total ($\beta = .14, p = .22$), and the subscales YRB-Mental Absence ($\beta = .15, p = .18$), TRP-Work Avoidance ($\beta = .12, p = .35$) and TRP-Interpersonal Problems ($\beta = .11, p = .36$). Given that both teachers and young people reported improvements in the number of problems and behaviours indicative of educational disengagement (as assessed by TRP-Total, YRB-Total), optimism is provided that the Operation Flinders program had a small behavioural effect for young people at higher risk of offending. However, as the results did not reach statistical significance ($p < .05$) the null hypothesis is not formally rejected.

Outcomes specific to motivation to change demonstrated greater variability, with both the Operation Flinders and control group cohort demonstrating differential improvements on the YRB-MTC and TRP-MTC measures. However, only the YRB-MTC Externalising Behaviour scale reached the small effect size criterion, with Operation Flinders participants demonstrating differential, but non-significant, improvements on this measure ($\beta = .10, p = .40$).

Table 8.12

Behavioural and Motivational Outcomes (BCQ) for Offending Risk Group (PSM With Replacement)

		Mean Pretest	SD Pretest	Mean Posttest	SD Posttest	β	p value
Youth-Report Behaviours (YRB) - Total	Control	12.18	3.75	12.37	3.76	0.11	0.26
	OF	12.25	4.29	11.32	4.73		
YRB - Classroom Avoidance	Control	1.31	0.83	1.33	0.85	0.07	0.52
	OF	1.23	0.83	1.15	0.86		
YRB - Externalising Behaviours	Control	3.79	1.36	3.90	1.35	0.09	0.40
	OF	3.67	1.52	3.52	1.64		
YRB - Mental Absence	Control	1.74	0.57	1.80	0.42	0.15	0.18
	OF	1.66	0.58	1.55	0.66		
YRB Motivation to Change (MTC) - Total	Control	2.25	0.67	2.25	0.68	-0.01	0.90
	OF	2.29	0.73	2.28	0.74		
YRB-MTC - Classroom Avoidance	Control	2.14	0.99	2.16	0.89	0.03	0.84
	OF	2.05	1.09	2.08	0.98		
YRB-MTC - Externalising Behaviours	Control	2.37	0.84	2.27	0.82	0.10	0.41
	OF	2.32	0.83	2.43	0.84		
YRB-MTC - Mental Absence	Control	2.29	0.96	2.31	0.93	0.00	0.97
	OF	2.22	0.98	2.29	0.96		
Teacher-Report Problems (TRP) - Total	Control	9.81	5.22	9.47	5.06	0.14	0.22
	OF	9.38	4.26	7.78	4.26		
TRP - School and Classroom Avoidance	Control	1.40	1.20	1.41	1.21	0.08	0.58
	OF	1.31	1.23	1.17	1.13		
TRP - Work Avoidance	Control	2.73	1.47	2.52	1.35	0.12	0.35
	OF	2.86	1.36	2.22	1.41		
TRP - Interpersonal Problems	Control	2.22	1.60	2.12	1.56	0.11	0.35
	OF	1.87	1.51	1.56	1.41		
TRP Motivation to Change (MTC) - Total	Control	1.79	0.76	1.78	0.84	-0.03	0.80
	OF	1.76	0.78	1.71	0.83		
TRP-MTC - School and Classroom Avoidance	Control	1.30	1.21	1.26	1.29	0.08	0.60
	OF	1.59	1.25	1.60	1.21		
TRP-MTC - Work Avoidance	Control	1.89	1.02	1.88	1.13	-0.03	0.84
	OF	1.88	1.04	1.80	1.12		
TRP-MTC - Interpersonal Problems	Control	1.55	1.00	1.62	1.05	-0.08	0.56
	OF	1.54	1.06	1.42	1.15		
Youth Problem Awareness	Control	0.91	0.37	0.95	0.36	0.04	0.72
	OF	0.94	0.36	1.00	0.31		

Table 8.13 summarises the outcome statistics specific to the longer-term behavioural measures. Between the 2013 and 2014 monitoring periods, the number of unexplained school absences increased less for the Operation Flinders cohort, than they did for the control group ($\beta = .21, p = .13$). That is, in 2013 both the Operation Flinders ($M = 8.37, SD = 11.53$) and control group ($M = 8.29, SD = 8.88$) were similar, however in 2014, Operation Flinders participants ($M = 11.21, SD = 13.15$), compared to the control group ($M = 16.83, SD = 17.82$), had a lower increase in unexplained absences. In contrast, the control group had a reduction in school explained absences ($M_{\text{pretest}} = 11.72, SD_{\text{pretest}} = 8.94; M_{\text{posttest}} = 9.70, SD_{\text{posttest}} = 8.59$), while the Operation Flinders cohort ($M_{\text{pretest}} = 11.59, SD_{\text{pretest}} = 10.50; M_{\text{posttest}} = 12.91, SD_{\text{posttest}} = 12.65$), had a marginal increase in explained absences across the same 2013-2014 monitoring period ($\beta = -.12, p = .34$).

Table 8.13

Longer-Term Educational Outcome Trends for Offending Risk Group (PSM With Replacement)

		Mean / % Pretest	SD Pretest	Mean / % Posttest	SD Posttest	β^f / OR ^g	<i>p</i> value
School Suspension/Exclusion (DECD) (%)	Control	40.00 ^a	n/a	18.08 ^b	n/a	1.39 ^g (0.20 to 9.49) ^e	0.73
	OF	38.79 ^a	n/a	12.56 ^b	n/a		
School Unexplained Absences	Control	8.29 ^c	8.88	16.83 ^d	17.82	0.21 ^f	0.13
	OF	8.37 ^c	11.53	11.21 ^d	13.15		
School Explained Absences	Control	11.72 ^c	8.94	9.70 ^d	8.59	-0.12 ^f	0.34
	OF	11.59 ^c	10.50	12.91 ^d	12.65		
School Attendance Rate (%)	Control	79.81 ^c	0.14	74.43 ^d	0.22	0.00 ^f	0.99
	OF	78.99 ^c	0.17	74.01 ^d	0.22		
Left School Within 12 Months (%)	Control	n/a	n/a	12.16	n/a	-1.31 ^g (0.21 to 8.05) ^e	0.77
	OF	n/a	n/a	14.28	n/a		

Note: ^aPretest measure corresponds to Term 2, 2013. ^bPosttest measure corresponds to Term 2, 2014. ^cPretest measure corresponds to Terms 1 and 2, 2013. ^dPosttest measure corresponds to Terms 1 and 2, 2014. ^eRange of 95% confidence interval for OR. ^fBeta (β). ^gOdds Ratio (OR).

Taken together, preliminary evidence is provided that the Operation Flinders participants at risk of future offending, compared to matched control group members, had a lower increase in unexplained absences, but an increase in explained absences across 2013 and 2014. Both results are statistically non-significant. While these longer-term educational trends require cautious interpretation, they are consistent with the short-term behavioural measures. For instance, increases in explained absences can be interpreted that young people are demonstrating greater compliance with educational reporting schedules. This remains a desirable program outcome given the alternative is that students may not report absences and they miss school without providing notification (e.g., being absent without parental or school permission). This latter outcome is captured in the measure: School Unexplained Absences. Given the rate of unexplained absences increased at a lower rate for the Operation Flinders participants (compared to the control group) between the years 2013 and 2014, optimism is provided that there was greater compliance with educational reporting schedules, which represents a desirable longer-term behavioural outcome.

In summary, there is some cause for optimism that young people at risk of future offending gained small behavioural (aggression reduction, improved behaviour in classroom and school functioning) and self-efficacy benefits by attending the Operation Flinders program, and longer-term behavioural trends are encouraging. However, the effects are small and statistically non-significant, and they were not replicated across the attitudinal outcomes and the measures conceptually related to wellbeing. Furthermore, the results needed to be interpreted in light of the strengths and weaknesses of this PSM model. Specifically, while the model's external validity is supported, the loss of variance through a high number of discarded control group members (50.9%) and multiple use of control members for matching (with up to 8 treatment cases) remains a threat to the internal validity of the modelling.

8.4 Educational Disengagement Risk Group

The educational disengagement risk group isolates Operation Flinders and control group members who reported having truanted from school on one or more occasions in the month prior to the start of the Operation Flinders program.

8.4.1 Development and Pre- and Post-Matching Balance of PSM Model

In the first iteration of the PSM model development, nearest neighbour 1:1 matching (*with replacement*) was applied using all 71 balance covariates. Owing to the high number of discarded Operation Flinders and control group participants, the number of PSM predictors was reduced for the same reasons cited for the Offending Risk Group (Section 8.3.1). Thirty-three PSM predictors were included in the final model, based upon their conceptual and predictive relationship with school achievement, engagement and educational outcomes (with reference to Table 2.2). As the BCQ (Youth- and Teacher-Report) and Behavior Academic Self-Esteem measures (BASE) contained multiple subscales tapping constructs conceptually related to educational disengagement, composite or total scale measures were only applied as PSM predictors. The complete list of predictors ($n = 33$) is detailed in Table Y.4.

To improve matching quality, a calliper width of .05 was applied, in line with the recommended guidelines by Austin (2011) and as discussed in detail in Section 7.3.5. The matched sample, as pooled across the 20 MI data sets, included 100 Operation Flinders and 37 control group participants (see Table 8.14). Approximately 26.0% and 42.2% of Operation Flinders and control group members were discarded through matching, respectively. Given the relatively high number of discarded Operation Flinders participants, external validity of the final model was assessed through review of the Operation Flinders pre- and post-matching scores for all 71 balance covariates (Table Y.4). The scoring distribution of covariates was similar across both pre- and post-matching models and external validity of the

retained model was supported. The greatest threat to the internal validity of the model is the reduction of variance through the use of the *with replacement* matching algorithm.

Detailed balance statistics for the 71 balance covariates can be found in Table Y.4.

As summarised in Table 8.14, prior to matching, 10 covariates demonstrated a small standardised difference (or effect size) across the Operation Flinders and control group, with 18.2% ($n = 6$) of these covariates functioning as PSM predictors, and having a conceptual and predictive relationship with school engagement, achievement and educational outcomes. None of these differences were statistically significant ($p > .05$).

Table 8.14

Summary of Pre- and Post-Matching Descriptives - PSM With Replacement (Educational Disengagement Risk Group)

	Pre-Matching		Post-Matching	
	OF	Control	OF	Control
Number of participants	135	64	100	37
Number of small standardised differences ($d > 0.2$, $\phi > 0.1$) across all 71 covariates	10		8	
Number of statistically significant differences ($p < .05$) across all 71 covariates	0		0	
Number of small standardised differences ($d > 0.2$, $\phi > 0.1$) across 33 PSM predictors	6		0	

Following the matching process, 8 of the 71 covariates exhibited small but non-significant effect size differences across the Operation Flinders and control group, with none of these covariates applied as PSM predictors in this model. The covariates demonstrating post-matching small effect size differences between the Operation Flinders and control group included: NAPLAN – Numeracy Score ($d = .33$), Satisfaction with Life ($d = .26$), Attitudes to

Police ($d = .27$), Identification with Criminal Others ($d = 0.30$), Intrinsic Value Orientation ($d = 0.29$), YRB MTC – School Avoidance ($d = .33$), TRP MTC – Interpersonal Problems ($d = .21$) and Offending Frequency ($d = .30$). Interestingly, five of these covariates did not demonstrate small between group effect size differences (e.g., $d > .20$) prior to PSM being undertaken. With reference to Chapter 2 (see Table 2.2), a number of these covariates have a conceptual relationship with educational engagement (e.g., satisfaction with life, offending attitudes and behaviour, value orientation). In other words, post-matching, the Operation Flinders and control group differ on variables that predict educational engagement outcomes. For this reason, questions surround the internal validity of the educational disengagement PSM model and cautious interpretation of the outcomes reported from this modelling are required.

8.4.2 Educational Disengagement Risk Group Outcome Analyses

Table 8.15 summarises the pretest and posttest descriptive statistics (mean, SD) and the regression-based measures (β and OR) specific to the short-term outcomes employed within the evaluation. There were differential improvements in favour of the Operation Flinders participants on all outcome measures. While three of these measures met Cohen's (1988) conventions for small effect size ($\beta > .10$), none of outcomes reached statistical significance ($p > .10$). This included the youth-report measure of Aggressive Impulses ($\beta > .13$), and the teacher-report measure tapping educational risk taking ($\beta > .10$), and the behavioural expression of student initiative within the classroom ($\beta > .10$).

Table 8.15

Short-Term Offending, Educational Engagement and Wellbeing Outcomes for Educational Disengagement Risk Group (PSM With Replacement)

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^b / OR ^c	<i>p</i> value
Truancy Frequency	Control	2.80	1.41	2.45	1.70	0.03 ^b	0.78
	OF	2.84	1.49	2.35	1.73		
Offending Frequency	Control	0.81	1.19	1.10	1.22	0.02 ^b	0.83
	OF	1.24	1.67	1.18	1.50		
Alcohol Consumption Frequency	Control	1.33	1.47	1.66	1.22	0.07 ^b	0.53
	OF	1.56	1.74	1.51	1.50		
Identification with Criminal Others	Control	12.30	3.34	12.57	3.41	0.02 ^b	0.86
	OF	13.29	3.25	12.94	3.55		
Attitudes to Police	Control	23.96	4.96	24.36	4.95	0.08 ^b	0.42
	OF	22.50	5.94	23.71	4.94		
Attitudes to Teachers	Control	23.58	4.95	23.62	5.23	0.01 ^b	0.96
	OF	22.76	4.99	23.21	4.94		
Aggressive Impulses	Control	23.15	8.33	23.75	9.13	0.13 ^b	0.28
	OF	23.31	7.97	21.26	8.25		
Self-Efficacy	Control	13.24	3.17	13.07	3.60	0.09 ^b	0.38
	OF	13.15	2.86	13.70	3.08		
Self-Esteem	Control	14.42	4.31	14.61	4.78	0.08 ^b	0.44
	OF	14.26	4.03	15.26	4.15		
Optimism	Control	6.78	1.71	6.88	1.75	0.03 ^b	0.76
	OF	6.66	1.59	6.96	1.68		
Intrinsic Value Orientation	Control	46.54	6.80	45.07	8.99	0.09 ^b	0.42
	OF	44.48	7.62	45.75	7.79		
Extrinsic Value Orientation	Control	27.17	7.03	28.11	8.72	0.09 ^b	0.40
	OF	26.29	7.65	25.88	8.38		
Satisfaction with Life	Control	15.64	4.70	15.52	4.40	0.01 ^b	0.90
	OF	14.43	4.62	14.95	4.60		
Aspire to Complete Year 12 (%)	Control	70.41	n/a	67.20	n/a	0.99 ^c (0.17 to 5.75) ^a	0.99
	OF	62.05	n/a	61.55	n/a		
Educational Risk Taking	Control	14.24	4.23	15.56	4.21	0.10 ^b	0.44
	OF	13.63	4.34	16.25	4.36		
Behavioral Academic Self-Esteem (BASE)	Control	47.60	11.55	51.77	9.74	0.08 ^b	0.39
	OF	45.91	10.49	52.85	9.50		
BASE - Student Initiative	Control	17.64	4.96	19.00	4.57	0.10 ^b	0.34
	OF	16.94	4.37	19.73	4.06		
BASE - Social Attention	Control	9.24	2.41	10.01	2.28	0.07 ^b	0.59
	OF	9.00	2.56	10.26	2.21		
BASE - Success-Failure	Control	5.73	1.94	6.57	1.61	0.02 ^b	0.89
	OF	5.60	1.86	6.61	1.71		
BASE - Social Attraction	Control	9.00	2.54	9.61	2.21	0.02 ^b	0.82
	OF	8.54	2.40	9.54	2.22		
BASE - Self-Confidence	Control	6.01	1.64	6.59	1.51	0.05 ^b	0.63
	OF	5.82	1.67	6.69	1.53		

Note: ^aRange of 95% confidence interval for OR.

Table 8.16 summarises the descriptive and outcome statistics for all measures relating to the Behavioural Change Questionnaire (Youth- and Teacher-Report). There was a universal pattern of small and non-significant differential pretest to posttest improvements in favour of the Operation Flinders group, for all behavioural measures, as operationalised through the YRB and TRP scales. Effects that reached Cohen's conventions for small effect size included YRB-Total ($\beta = .15, p = .10$), TRP-Work Avoidance ($\beta = .12, p = .25$), YRB-Classroom Avoidance ($\beta = .17, p = .11$), and YRB-Externalising Behaviours ($\beta = .18, p = .06$).

Outcomes specific to motivation to change demonstrated greater level of variability, with both the Operation Flinders and control group cohort demonstrating differential improvements on the YRB-MTC and TRP-MTC measures. Three measures reached the threshold for small effect. The YRB MTC Mental Absence ($\beta = .10, p = .35$) demonstrated a small differential effect in favour of the Operation Flinders group, while the TRP MTC Interpersonal Problems ($\beta = -.13, p = .50$) and the TRP MTC-Total ($\beta = -.10, p = .43$) measure demonstrated a small differential effect in favour of the control group.

Table 8.16

*Behavioural and Motivational Outcomes (BCQ) for Educational Disengagement Risk Group
(PSM With Replacement)*

		Mean Pretest	SD Pretest	Mean Posttest	SD Posttest	β	p value
Youth-Report Behaviours (YRB) - Total	Control	11.95	4.37	12.71	3.41	0.15	0.10
	OF	12.31	4.14	11.45	4.33		
YRB - Classroom Avoidance	Control	1.48	0.79	1.63	0.61	0.17	0.11
	OF	1.49	0.71	1.35	0.79		
YRB - Externalising Behaviours	Control	3.50	1.55	3.97	1.32	0.18	0.06
	OF	3.61	1.58	3.40	1.65		
YRB - Mental Absence	Control	1.66	0.70	1.60	0.61	0.03	0.77
	OF	1.64	0.61	1.55	0.67		
YRB Motivation to Change (MTC) - Total	Control	2.23	0.64	2.27	0.67	0.02	0.83
	OF	2.21	0.76	2.30	0.82		
YRB-MTC - Classroom Avoidance	Control	2.40 ^a	1.10	2.36	0.99	n/a	n/a
	OF	2.01 ^a	1.05	2.17	1.06		
YRB-MTC - Externalising Behaviours	Control	2.37	0.86	2.42	0.78	0.06	0.65
	OF	2.20	0.84	2.48	0.91		
YRB-MTC - Mental Absence	Control	2.20	0.90	2.15	1.00	0.10	0.35
	OF	2.14	1.02	2.36	0.99		
Teacher-Report Problems (TRP) - Total	Control	9.02	4.68	7.48	4.39	0.05	0.59
	OF	9.24	4.43	7.07	4.21		
TRP - School and Classroom Avoidance	Control	1.46	1.17	1.19	1.11	0.00	1.00
	OF	1.50	1.22	1.20	1.16		
TRP - Work Avoidance	Control	2.72	1.42	2.29	1.36	0.12	0.25
	OF	2.77	1.41	1.96	1.38		
TRP - Interpersonal Problems	Control	1.67	1.62	1.43	1.43	0.05	0.68
	OF	1.71	1.51	1.29	1.35		
TRP Motivation to Change (MTC) - Total	Control	1.81	0.79	1.98	0.81	-0.10	0.43
	OF	1.79	0.84	1.79	0.82		
TRP-MTC - School and Classroom Avoidance	Control	1.96	1.38	1.84	1.11	0.00	1.00
	OF	1.82	1.19	1.79	1.22		
TRP-MTC - Work Avoidance	Control	1.97	1.02	2.12	1.10	-0.05	0.74
	OF	1.94	1.09	2.00	1.18		
TRP-MTC - Interpersonal Problems	Control	1.60	1.03	1.74	1.08	-0.13	0.50
	OF	1.55	1.07	1.47	1.39		
Youth Problem Awareness	Control	0.93	0.27	1.06	0.25	-0.03	0.77
	OF	0.92	0.35	1.04	0.28		

Note: ^aSmall ($d > 0.20$), but non-significant difference, between pretest scores, $t(57) = 1.17, p > .05, d = 0.31$, therefore outcome result not reported (as per rationale provided in Section 7.3.6.1).

Table 8.17 summarises the descriptive and outcome statistics specific to the longer-term behavioural measures. Two outcomes met Cohen's criteria for small effect size ($\beta > .10$, $OR > 2.0$). That is, young people attending the Operation Flinders program had higher rates of explained school absences ($\beta = -.11$, $p = .31$), and lower school attendance rates ($\beta = -.11$, $p = .30$), across the 2013 and 2014 monitoring period. While these results are contrary to program objectives, they need to be interpreted in light of their small effects and non-significance. Furthermore, as noted in Section 8.3.2 (Offending Risk Group), explained absences may indicate that young people are demonstrating greater compliance with educational reporting schedules. This remains a desirable program outcome given the alternative is that students may not report absences and they miss school without providing notification (e.g., going absent without parental or school permission).

Table 8.17

*Longer-Term Educational Outcome Trends for Educational Disengagement Risk Group
(PSM With Replacement)*

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^f / OR ^g	<i>p</i> value
School Suspension/Exclusion (DECD) (%)	Control	28.65 ^a	n/a	9.24 ^b	n/a	1.29 ^g (0.34 to 5.49) ^c	0.74
	OF	30.68 ^a	n/a	8.32 ^b	n/a		
School Unexplained Absences	Control	10.48 ^c	11.38	12.85 ^d	15.64	-0.04 ^f	0.74
	OF	11.18 ^c	12.71	14.50 ^d	16.11		
School Explained Absences	Control	12.26 ^c	9.18	10.44 ^d	8.79	-0.11 ^f	0.31
	OF	11.10 ^c	9.75	13.06 ^d	13.08		
School Attendance Rate (%)	Control	77.69 ^c	0.15	76.96 ^d	0.21	-0.11 ^f	0.30
	OF	76.61 ^c	0.18	70.56 ^d	0.24		
Left School Within 12 Months (%)	Control	n/a	n/a	14.84	n/a	-1.60 ^g (0.41 to 6.24) ^c	0.50
	OF	n/a	n/a	21.51	n/a		

Note: ^aPretest measure corresponds to Term 2, 2013. ^bPosttest measure corresponds to Term 2, 2014. ^cPretest measure corresponds to Terms 1 and 2, 2013. ^dPosttest measure corresponds to Terms 1 and 2, 2014. ^eRange of 95% confidence interval for OR. ^fBeta (β). ^gOdds Ratio (OR).

In summary, questions surround the internal validity of the PSM modelling (lack of equivalency) specific to the educational disengagement risk group. For this reason, cautious interpretation of the following summary statements is required. Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing and motivation to change. While there is some optimism that short-term behavioural outcomes may be possible, this needs to be interpreted in light of their small effect sizes, and non-significant results. Longer-term outcome trends remain less certain.

8.5 Wellbeing Risk Group

The wellbeing risk group isolates Operation Flinders and control group members who scored below the median on the Satisfaction with Life scale at the pretest.

8.5.1 Development and Pre- and Post-Matching Balance of PSM Model

To develop the model, nearest neighbour 1:1 matching (*with replacement*) was applied using all 71 balance covariates as PSM predictors. For the same reasons stated with the previous PSM models, the number of covariates was reduced. In the final model, the subscales specific to the BCQ (Youth-Report) and Behavior Academic Self-Esteem measures (BASE) were removed, and only the NAPLAN-Reading scale was included as a measure of educational achievement. The complete list of PSM predictors ($n = 55$) is detailed in Table Y.5.

A calliper width of .05 was applied. The matched pooled sample included 134 Operation Flinders and 54 control group participants (see Table 8.18). Approximately 23.9% and 43.2% of the Operation Flinders and control group members were discarded through the matching process, respectively. External validity of the final model was evaluated by reviewing the patterned distribution of the Operation Flinders pre- and post-matching scores for all 71 balance covariates (Table Y.5). The matched sample demonstrated a consistent pattern of lower rates of truancy, offending, suspension, exclusion and behavioural problems compared to the pre-matched Operation Flinders cohort. However, as differences between the pre- and post-matched samples were less than 5%, external validity of the retained model was supported. As noted in the previous sections of this chapter, the greatest threat to the internal validity of this PSM model is the reduction of variance through the use of the *with replacement* matching algorithm.

Detailed balance statistics for the 71 balance covariates can be found in Table Y.5. As summarised in Table 8.18, prior to matching, 17 covariates demonstrated a small standardised difference (or effect size) across the Operation Flinders and control groups, with 82.4% ($n = 14$) of these covariates functioning as PSM predictors. None of these differences were statistically significant ($p > .05$).

Table 8.18

Summary of Pre- and Post-Matching Descriptives - PSM With Replacement (Wellbeing Risk Group)

	Pre-Matching		Post-Matching	
	OF	Control	OF	Control
Number of participants	176	95	134	54
Number of small standardised differences ($d > 0.2$, $\phi > 0.1$) across all 71 covariates	17		4	
Number of statistically significant differences ($p < .05$) across all 71 covariates	0		0	
Number of small standardised differences ($d > 0.2$, $\phi > 0.1$) across 55 PSM predictors	14		2	

Following the matching process, four covariates exhibited small but non-significant effect size differences across the Operation Flinders and control groups. This included the BCQ YRP-Externalising Behaviours subscale ($d = 0.22$) and three motivation to change subscales: YRB-MTC Externalising Behaviours ($d = 0.37$), TRP MTC-Classroom and School Avoidance ($d = 0.22$) and TRP MTC-Interpersonal Problems ($d = 0.37$). As noted within Chapter 6, no consistent relationship was found between the BCQ motivation to change scales and measures conceptually related to wellbeing. Given this, and that the number of unbalanced covariates approached the range of chance (less than 6% of total number of PSM predictors), the PSM model is supported.

8.5.2 Poor Wellbeing Risk Group Outcome Analyses

Table 8.19 summarises the pretest posttest descriptive statistics (mean, SD) and the regression-based measures (β and OR) specific to the short-term outcomes employed within the evaluation. The following pattern emerged within the data. Differential, but non-significant, improvements in favour of the Operation Flinders participants clustered on the

measures conceptually related to wellbeing (self-esteem, self-efficacy, intrinsic and extrinsic value orientation, optimism, satisfaction with life). However, only self-esteem reached the threshold for small effect size ($\beta = .10$, $p = .16$). Conversely, behaviourally orientated scales (e.g., offending, truancy, alcohol consumption, two BASE subscales), demonstrated differential but non-significant effects in favour of the control group. However, only the Truancy Frequency measure met the small effect size threshold ($\beta = -.10$, $p = .19$).

Table 8.19

Short-Term Offending, Educational Engagement and Wellbeing Outcomes for Wellbeing Risk Group (PSM With Replacement)

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^b / OR ^c	<i>p</i> value
Truancy Frequency	Control	0.88	1.43	0.99	1.42	-0.10 ^b	0.19
	OF	1.12	1.65	1.50	1.75		
Offending Frequency	Control	0.63	1.30	0.69	1.11	-0.04 ^b	0.56
	OF	0.80	1.45	0.89	1.32		
Alcohol Consumption Frequency	Control	0.85	1.30	0.92	1.11	-0.07 ^b	0.43
	OF	1.03	1.45	1.21	1.32		
Identification with Criminal Others	Control	12.89	3.26	12.46	3.47	0.02 ^b	0.81
	OF	13.06	3.78	12.69	3.36		
Attitudes to Police	Control	23.37	6.08	23.78	4.87	0.05 ^b	0.51
	OF	23.23	5.79	24.43	4.93		
Attitudes to Teachers	Control	22.86	5.08	22.70	4.41	0.05 ^b	0.58
	OF	22.89	4.86	23.18	4.30		
Aggressive Impulses	Control	22.48	8.41	20.28	8.46	-0.01 ^b	0.88
	OF	23.39	8.41	21.06	8.77		
Self-Efficacy	Control	12.32	3.06	12.88	2.87	0.07 ^b	0.45
	OF	12.53	2.98	13.41	3.04		
Self-Esteem	Control	12.69	3.50	13.40	4.01	0.10 ^b	0.16
	OF	12.78	3.66	14.33	3.76		
Optimism	Control	5.88	1.61	6.26	1.62	0.07 ^b	0.45
	OF	6.02	1.55	6.60	1.76		
Intrinsic Value Orientation	Control	44.57	7.72	45.02	7.87	0.07 ^b	0.45
	OF	44.29	8.49	46.18	8.37		
Extrinsic Value Orientation	Control	25.30	7.65	25.25	7.61	0.05 ^b	0.62
	OF	25.53	7.53	24.60	8.22		
Satisfaction with Life	Control	11.26	3.16	12.66	4.05	0.07 ^b	0.44
	OF	11.21	3.04	13.26	4.07		
Aspire to Complete Year 12 (%)	Control	71.39	n/a	75.21	n/a	-1.82 ^c (0.45 to 7.34) ^a	0.58
	OF	68.86	n/a	67.55	n/a		
Educational Risk Taking	Control	15.03	4.14	16.84	4.36	0.00 ^b	0.99
	OF	14.84	4.16	16.77	4.34		
Behavioral Academic Self-Esteem (BASE)	Control	47.47	11.12	53.71	9.21	-0.01 ^b	0.90
	OF	47.67	10.20	53.56	9.42		
BASE - Student Initiative	Control	17.59	4.58	19.92	4.32	0.01 ^b	0.91
	OF	17.91	4.27	20.19	4.11		
BASE - Social Attention	Control	9.51	2.69	10.60	2.53	-0.04 ^b	0.68
	OF	9.41	2.42	10.35	2.19		
BASE - Success-Failure	Control	5.84	1.94	6.81	1.49	-0.07 ^b	0.53
	OF	5.82	1.80	6.57	1.59		
BASE - Social Attraction	Control	8.68	2.40	9.68	2.10	0.02 ^b	0.86
	OF	8.46	2.43	9.67	2.16		
BASE - Self-Confidence	Control	5.86	1.78	6.71	1.34	0.01 ^b	0.95
	OF	6.05	1.61	6.80	1.47		

Note: ^aRange of 95% confidence interval for OR.

The descriptive and outcome statistics for the Behavioural Change Questionnaire (Youth- and Teacher-Report) is found in Table 8.20. Interestingly, unlike the Educational Disengagement and Offending Risk Groups, there was no pattern of differential behavioural outcomes, in favour of the Operation Flinders cohort, as measured on the YRB or TRP scales. Only the YRB MTC-Mental Absence measure demonstrated a small effect size in favour of the Operation Flinders group ($\beta = .11, p = .22$).

Table 8.20

Behavioural and Motivational Outcomes (BCQ) for Poor Wellbeing Risk Group (PSM With Replacement)

		Mean Pretest	SD Pretest	Mean Posttest	SD Posttest	β	<i>p</i> value
Youth-Report Behaviours (YRB) - Total	Control	9.75	4.59	9.73	4.34	0.00	0.96
	OF	10.28	4.58	10.01	4.91		
YRB - Classroom Avoidance	Control	0.81	0.86	0.91	0.92	0.01	0.91
	OF	0.93	0.89	0.99	0.90		
YRB - Externalising Behaviours	Control	2.87	1.78	2.87	1.87	0.00	0.99
	OF	3.06	1.80	2.99	1.89		
YRB - Mental Absence	Control	1.71	0.57	1.66	0.62	0.06	0.55
	OF	1.71	0.57	1.58	0.60		
YRB Motivation to Change (MTC) - Total	Control	2.16	0.76	2.22	0.73	0.06	0.52
	OF	2.20	0.82	2.33	0.79		
YRB-MTC - Classroom Avoidance	Control	2.19	1.08	2.27	1.08	0.04	0.78
	OF	2.09	1.14	2.16	1.08		
YRB-MTC - Externalising Behaviours	Control	2.02 ^a	0.88	2.12	0.85	n/a	n/a
	OF	2.37 ^a	0.97	2.44	0.91		
YRB-MTC - Mental Absence	Control	2.10	0.94	2.19	0.91	0.11	0.22
	OF	2.10	1.02	2.45	1.04		
Teacher-Report Problems (TRP) - Total	Control	7.40	4.89	6.30	4.58	0.02	0.81
	OF	8.07	4.55	6.52	4.42		
TRP - School and Classroom Avoidance	Control	0.92	1.15	0.90	1.12	0.00	0.98
	OF	1.09	1.16	0.98	1.12		
TRP - Work Avoidance	Control	2.24	1.53	1.90	1.52	0.05	0.61
	OF	2.43	1.52	1.86	1.42		
TRP - Interpersonal Problems	Control	1.32	1.57	1.13	1.39	0.01	0.91
	OF	1.49	1.44	1.24	1.36		
TRP Motivation to Change (MTC) - Total	Control	1.50	0.80	1.65	0.75	-0.02	0.81
	OF	1.60	0.81	1.73	0.88		
TRP-MTC - School and Classroom Avoidance	Control	1.08	1.15	1.18	1.27	0.09	0.58
	OF	1.34	1.28	1.49	1.27		
TRP-MTC - Work Avoidance	Control	1.83	0.99	1.87	1.04	0.02	0.88
	OF	1.74	1.15	1.91	1.22		
TRP-MTC - Interpersonal Problems	Control	1.21 ^b	1.08	1.28	1.06	n/a	n/a
	OF	1.60 ^b	1.17	1.48	1.24		
Youth Problem Awareness	Control	0.91	0.32	1.00	0.26	0.04	0.60
	OF	0.90	0.31	1.02	0.28		

Note: ^aSmall pretest score difference between Operation Flinders and control group and therefore outcome result not reported, $t(73) = 1.51, p > .05, d = 0.35$. ^bSmall pretest score difference between Operation Flinders and control group and therefore outcome result not reported, $t(79) = .99, p > .05, d = 0.22$.

Table 8.21 summarises the descriptive and outcome statistics specific to the longer-term behavioural measures. There were no statistically significant differences between Operation Flinders and control group participants on suspension/exclusion, explained and unexplained absences, and school attendance rate. However, Operation Flinders participants at risk of poor future wellbeing, were 3.2 times more likely to have left school within 12 months after the completion of the Operation Flinders program, in comparison to young people who did not attend the program (OR = 3.2, $p = .26$). This result needs to be interpreted in light of two points. First, it cannot be ruled out that the result is due to chance ($p > .05$). Second, the outcome of leaving school is unknown. It is possible that young people left school to pursue vocational or employment pathways or it may be reflective of an avoidant behavioural pattern.

Table 8.21

Longer-Term Educational Outcome Trends for Poor Wellbeing Risk Group (PSM With Replacement)

		Mean (%) Pretest	SD Pretest	Mean (%) Posttest	SD Posttest	β^f / OR^g	p value
School Suspension/Exclusion (DECD) (%)	Control	23.95 ^a	n/a	8.67 ^b	n/a	0.92 ^g (0.11 to 7.83)	0.94
	OF	30.09 ^a	n/a	9.03 ^b	n/a		
School Unexplained Absences	Control	6.44 ^c	8.70	10.11 ^d	13.51	-0.01 ^f	0.90
	OF	7.80 ^c	10.48	11.20 ^d	14.15		
School Explained Absences	Control	10.89 ^c	8.82	9.44 ^d	9.01	-0.08 ^f	0.45
	OF	11.50 ^c	12.00	11.39 ^d	11.25		
School Attendance Rate (%)	Control	82.55 ^c	0.14	80.75 ^d	0.18	-0.09 ^f	0.34
	OF	80.49 ^c	0.17	75.80 ^d	0.21		
Left School Within 12 Months (%)	Control	n/a	n/a	8.01	n/a	-3.23 ^g (0.41 to 25.14) ^e	0.26
	OF	n/a	n/a	19.07	n/a		

Note: ^aPretest measure corresponds to Term 2, 2013. ^bPosttest measure corresponds to Term 2, 2014. ^cPretest measure corresponds to Terms 1 and 2, 2013. ^dPosttest measure corresponds to Terms 1 and 2, 2014. ^eRange of 95% confidence interval for OR. ^fBeta (β). ^gOdds Ratio (OR).

In summary, for participants at risk of poor wellbeing, Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing and motivation to change. Longer-term outcome trends do not provide consistent support for program effectiveness for this cohort.

8.6 Chapter Summary

This chapter has detailed the development and balance statistics of five PSM models, specific to the entire sample, offending, educational disengagement and the wellbeing risk groups. Apart from the educational disengagement risk group, all PSM models achieved equivalence across the Operation Flinders and control group, based upon measured covariates, to support internally valid regression-based outcome analyses. The analyses specific to the educational disengagement risk group requires more cautious interpretation. It is noted that PSM is a statistical process that is optimised with larger samples (Rubin, 1997), and as reported within this chapter, the PSM models founded upon larger samples (entire sample with and without replacement), and including all covariates as PSM predictors, demonstrated higher levels of equivalence, compared to the stratified risk groups. Furthermore, the loss of variance arising from the use of the “with replacement” algorithm for the three stratified groups remains a threat to the internal validity of these models. Taken as a whole, the outcome analyses specific to the entire sample (*with* and *without* replacement) are the most robust outcomes reported within this research.

Across both the selected risk and entire sample groups, Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on measures conceptually related to reduced offending, higher levels of educational disengagement, enhanced wellbeing and motivation to change. The

most consistent pattern of program effects was for participants at higher risk of future offending. These small, but non-significant effects, clustered most strongly on behavioural outcomes (e.g., YRB, TRP, aggressive impulses). This pattern of effects was replicated, in part, for young people at risk of educational disengagement, which is not surprising as 56.8% of Operation Flinders participants within this group (matched sample) were also within the Offender Risk Group.

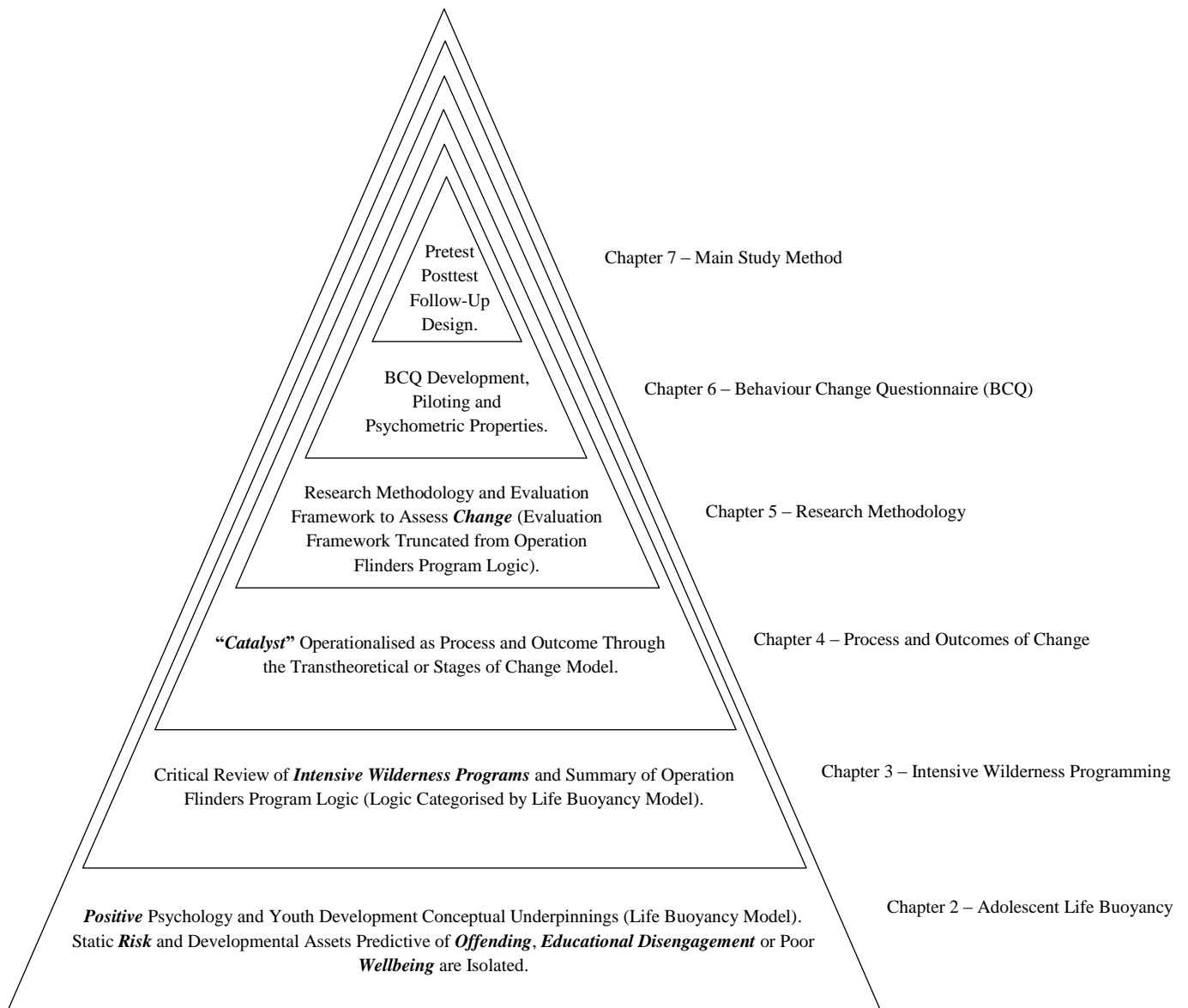
This chapter provides evidence that small improvements in motivation to change, relative to the control group, are possible through Operation Flinders program attendance. However, this is not consistent across risk groups or behavioural type. Operation Flinders program attendance demonstrated no impact on youth problem awareness, as operationalised through the youth and teacher-report BCQ.

Longer-term program trends are more difficult to interpret within the evaluation. While the evaluation provides optimism that longer-term behavioural outcomes may be possible for young people with offending risk profiles, the effect sizes are within the small range, and they do not demonstrate consistency across the risk cohorts or outcome type.

Chapter 9

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future offending, educational disengagement or poor wellbeing?

Chapter 8 – Results
 Chapter 9 – Discussion
 Chapter 10 - Conclusions



9 Discussion

The aim of this chapter is to review the results reported in Chapter 8 in the context of the research question, hypotheses and methodology, and the wilderness-adventure literature. The chapter brings a critical lens to internal and external validity specific to the research methodology and instrumentation (BCQ). The chapter includes a review of cross-discipline intervention research and identifies future research directions.

9.1 Research Question and Design

This research set out to systematically answer the following research question:

Can “intensive wilderness programs” be a “catalyst” for “positive” “change” for young people at “risk” of future “offending”, “educational disengagement” or poor “wellbeing”?

Across Chapters 2 to 5, the terms within quotation marks were operationalised, and the research question addressed through three interdependent research phases comprised of (1) Behavioural Change Questionnaire (BCQ) development and refinement (pilot study), (2) BCQ validation and program evaluation (main study) and (3) assessment of long-term behavioural outcomes (follow-up study). The BCQ was designed with reference to the Transtheoretical Model (TM; Prochaska et al., 1992), and it assessed behavioural and motivational constructs specific to educational engagement for youth-at-risk in mainstream school settings. The BCQ’s behavioural dimensions demonstrated good psychometric properties, with emerging evidence of construct validity for the BCQ’s motivational dimensions.

The BCQ was integrated within a quasi-experimental evaluation (pretest posttest follow-up design) that included youth- and teacher-report measures conceptually and empirically related to (1) offending, (2) educational engagement and (3) wellbeing. The

measures were defined as developmental assets, and categorised by a positive psychology conceptual model (Life Buoyancy Model) and evaluation framework (Table 5.1). Longer-term outcome trends were assessed through electronically coded behavioural measures. Multiple imputation was undertaken to address missing data (20 MI data sets) and propensity score matching (PSM) applied to match treatment (n = 345) and control groups (n = 209) across the measured covariates (n = 71). Five separate PSM models were developed and regression based analyses conducted separately for the entire sample, and offending, educational disengagement and poor wellbeing risk groups.

9.2 Outcomes and Process of Change

The research question was operationalised through two research hypotheses which, at the broadest level, assessed the “processes” and “outcomes” of change. They are considered in turn.

9.2.1 Outcomes of Change

The first hypothesis predicted that:

Young people undertaking the Operation Flinders program, with static risk factors predictive of future offending, educational disengagement or poor wellbeing, have higher levels of functioning on measures conceptually related to these outcomes, compared to matched young people with the same risk profile who are not exposed to the Operation Flinders program.

Across the five PSM models reported in Chapter 8, Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on measures conceptually related to reduced offending, higher levels of educational disengagement or enhanced wellbeing. The most consistent pattern of program effects was for participants at higher risk of future offending. These small, but non-significant effects, clustered most strongly on behavioural outcomes (e.g., YRB, TRP,

aggressive impulses), with longer-term educational outcomes trending in the same direction. However, all results failed to reach statistical significance ($p > .05$).

In short, while the study provides some optimism that the Operation Flinders program had a positive impact on behavioural outcomes for youth at risk of offending, the first hypothesis is not supported.

9.2.2 Processes of Change

The second hypothesis predicted that:

Young people undertaking the Operation Flinders intervention, with static risk factors predictive of future offending, educational disengagement or poor wellbeing, have greater motivation to make changes in behaviours indicative of educational disengagement, compared to matched young people with the same risk profile who are not exposed to the Operation Flinders intervention (process of change).

Across the five PSM models reported in Chapter 8, Operation Flinders program attendance was not associated with statistically significant and differential improvements, relative to a control group, on measures assessing motivation to change (including youth problem awareness), specific to the assessment of “youth reported behaviour” (YRB-MTC) and “teacher-reported problems” (TRP-MTC). While Chapter 8 provides evidence that small improvements in motivation to change, relative to the control group, are possible through Operation Flinders program attendance, this is not consistent across risk groups or behavioural type. In short, the second hypothesis is not supported.

9.2.3 Summary

These aforementioned hypotheses operationalised the broader research question. On this basis, this research offers no conclusive empirical evidence that the Operation Flinders program is a catalyst for positive change for young people at risk of future offending, educational disengagement or poor wellbeing. However, this statement must now be assessed

in terms of a critical review of the internal and external validity of the study methodology, the instruments applied and the statistical analyses undertaken.

9.3 Methodological Review: Internal and External Validity

This section critically reviews the research methodology, with a specific focus on the research implementation; the conceptualisation, development and validation of the BCQ; and statistical processes. Throughout this thesis, significant attention has been paid to identifying threats to internal and external validity as they have arisen, notably across Chapters 5, 6, 7 and 8. Therefore the aim of this section is to consolidate the key themes and identify the threats that pose the greatest risk to the validity of the methodology and the conclusions drawn.

9.3.1 Applied Methodology

This section focuses on the applied implementation of the study (excluding discussion on the BCQ which occurs in a subsequent section). As discussed in Chapter 5, the assessment of “change” and the research design was benchmarked against the randomised control trial (RCT), but following the identification of multiple applied and ethical constraints, the study employed a quasi-experimental pretest posttest follow-up design.

There are multiple possible threats to the internal validity of repeated testing evaluations (see Brewer, 2000; Campbell & Stanley, 1963; McMillan, 2007). A significant threat identified in the main study was an instrumentation effect (Pepper et al., 2010). The study sought to implement reliable, validated and sensitive measures for the participant cohort. Apart from isolated examples (e.g., optimism measure, extrinsic value orientation), Chapter 7 revealed that the measures demonstrated strong internal consistency, with consistent evidence of construct validity (in the expected direction) with measures conceptually related to offending, educational disengagement and poor wellbeing.

However, a more significant threat observed in the research was the inconsistent implementation of instruments (testing effects). This is discussed in detail in Section 7.1.6. Specifically, given the geographically dispersed participant cohort (see Section 5.2.2.2), the researcher supported key liaison personnel across 59 referral agencies to implement the research processes. In many cases, the researcher had low visibility and control over the research implementation and there was evidence of the key liaison person not following (or reading) the research protocols. An important confound that was noted through discussion with key liaison personnel was intervention dosage; particularly the start time of intervention. That is, does the intervention start at the point when youth enter the wilderness program location, or does it start earlier? A number of referral agency personnel indicated that they started to prepare young people for the program weeks and sometimes months ahead of time. In other words, the intervention or “treatment” was not consistently applied between participants. In short, it is possible that for some program participants the pretest was not associated with the true baseline in terms of attitudes and behavioural functioning. Given the conditions to assess program fidelity (and program variation) were not present (see Section 3.5.2), program variations were not able to be assessed nor tracked in the evaluation.

Related to this point, and as discussed in Section 7.1.6, the evaluation found evidence of instruments being implemented inconsistently across the research sites, for instance on school buses, the school yard, or in a classroom. A number of these factors reflect the highly applied nature of the study, particularly the mobile, at-risk and disengaged nature of the participant group. It is noted that there are numerous challenges in conducting large scale field research (Eisner et al., 2011), particularly studies (as in the current research) occurring over multiple sites, where significant attention has to be paid to study implementation to manage threats to internal validity (Taxman & Rhodes, 2010). In short, testing effects remain a notable threat to the internal validity of the study and conclusions drawn.

The study employed a population sampling approach, with a higher than expected response rate. However, lower response rates were noted for sub-cohorts of participants, namely young people likely to present with higher risk profiles (e.g., youth from alternative education sites). In short, the 2013 study cohort was not fully representative of the broader population, with a lower proportion of young people with risk factors related to future offending, educational disengagement and poor wellbeing. While this poses a risk to the external validity of the study (particularly for the entire sample analyses reported in Chapter 8), the stratification of the analyses for different risk groups provides an opportunity to strengthen external validity of the results for the stratified cohorts (Tipton, 2013).

As discussed across Chapters 3 and 5, at the time of data collection, there was a lack of descriptive operationalisation of the Operation Flinders program. In other words, there were no program logic and theory (supported by operational guidelines) to support the monitoring of program fidelity (Lösel, 2007), or to assess the dosage of intervention received by participants. As discussed in Chapter 2, interventions exhibiting higher program integrity are associated with stronger program impact. It is highly probable that the 2013 Operation Flinders cohort received markedly different levels of program dosage, both in terms of the within program experience, and the levels of pre- and post-program support. This remains a significant threat to a study's internal and external validity (Fixsen et al., 2009; Mowbray et al., 2003; Royse et al., 2010) and one of the strongest limitations of the research design.

9.3.2 Behaviour Change Questionnaire

The internal validity of the conclusions drawn remains heavily dependent on the BCQ being both conceptually and psychometrically sound. This section brings attention to this critical review, with a focus on the BCQ's underlying conceptual framework (TM), and its assessment of behavioural and motivational dimensions.

9.3.2.1 *Transtheoretical Model (TM)*

The BCQ was theoretically inspired and operationalised through the Transtheoretical Model (TM; Prochaska et al., 1992). Despite its widespread appeal and application, TM is not without its detractors (see Section 4.6). Specifically, the conceptual organisation and the psychometric rigour of tools operationalising the model have attracted criticism (Bandura, 1997a; Littell & Girvin, 2002; Sutton, 2001; Weinstein et al., 1998).

Consistent with the strong argument provided by Littell and Girvin (2002), this research sought to develop a continuous measurement of motivation to change underpinned by the constructs of problem awareness, cognitive intentions and behavioural activation (see Section 4.7). Therefore, while the BCQ was developed from a strong conceptual basis (TM), the operationalisation of motivation to change through a continuous set of constructs is underdeveloped within the literature (Littell & Girvin, 2002). Furthermore, there is an argument that the “model should be used cautiously with adolescents...given the limited amount of evidence” (Spencer et al., 2006, p. 438). Collectively, there are both conceptual and empirical questions in terms of the TM’s utility to be operationalised as a continuous construct for the current cohort.

Unlike pre-existing motivation to change tools, the BCQ brought an assessment focus to a multi-dimensional construct (educational engagement), where the assumption that presenting behaviours represent a “problem” is not met (see Section 6.1). Therefore, the BCQ had to assess both behavioural (student behaviour recognition, teacher-reported problems), and motivational constructs related to educational engagement. This approach and context remains largely untested for two reasons. First, it represents the first systematic attempt to assess motivation and behavioural change across mainstream school settings. Second, by assessing a multidimensional construct (educational engagement); the BCQ deviated away from pre-existing tools and literature that restricted their assessment to singular and defined

problems. For this reason, there is a lack of conceptual or empirical evidence to assess the validity of development of the BCQ across this context and multidimensional application. It is possible that tools have been developed, but owing to their poor psychometric properties, they remain unpublished.

Given the context noted, the BCQ was developed with reference to the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ; Rieger & Touyz, 2006; Rieger et al., 2000; Rieger et al., 2002). This tool operationalises the symptoms of anorexia nervosa through the multidimensional properties of cognitions, emotions and behaviour. Motivation to change is assessed in relation to the specific properties of the disorder, including body shape and weight, eating behaviours and treatment engagement (Rieger et al., 2000). However, unlike the assessment of educational engagement with the BCQ, with the ANSOCQ, the properties of the disorder load onto a singular and confirmed diagnosis (anorexia nervosa). Therefore, unlike existing TM measures, including the ANSOCQ, the BCQ confounds the assessment of behaviour and motivation within its construction.

In short, while the BCQ has been developed from a conceptually sound framework (TM), its application to the current context (education), participant group (adolescents), behavioural type (educational disengagement) and measurement parameters (continuous variable) remains underdeveloped within the literature. Therefore, the validity of the BCQ can only be assessed on the basis of the psychometric evidence reported in this thesis. This evidence, specific to the behavioural and motivational domains, is reviewed in the following sections.

9.3.2.2 Behavioural Dimensions

The BCQ operationalised two behavioural constructs of educational engagement: youth-reported behaviour (YRB, or behavioural recognition) and teacher-reported problems (TRP). The YRB-Total (18-item) demonstrated strong construct validity. Factor analysis

supported a three-factor solution: Externalising Behaviour (seven-item), Classroom Avoidance (two-item) and Mental Alertness (two-item). The factors demonstrated discriminant validity with constructs conceptually related to offending, educational disengagement and wellbeing. The strongest psychometric properties were associated with the Externalising Behaviour factor.

The TRP measures also demonstrated strong construct validity, although the pattern of inter-correlations with constructs conceptually related to offending, educational engagement and wellbeing were smaller compared to the YRB measures. However, Chapter 6 and 7 note that measures completed by the same source (e.g., teacher or youth informants) demonstrated stronger inter-correlational patterns, compared to measures from different informants. Thus, this smaller correlational pattern noted in this research may, in part, be attributed to this point. Factor analysis identified three latent factors: School and Classroom Avoidance (four-item), Interpersonal Problems (four-item) and Work Avoidance (four-item). The factors demonstrated sound psychometric properties, including evidence of discriminant validity, and warrant consideration for further research application. Collectively, Chapter 6 concludes that the TRP and YRB measures are assessing independent constructs, which is not surprising given their content focus on “problems” versus “behaviours”. Overall, while the psychometric utility of the BCQ’s behavioural dimensions is strongly supported in this research, the interpretation of the latent factors should also be done in consideration to the possible confounding of individual behaviour within the factor. For instance, it is possible that the presence of a single behaviour may have either more or less impact on a youth’s psychosocial functioning, compared to multiple behaviours being present. Thus, higher latent factor scores may not be correlated with functional impact. The assessment of this confound remains an area of future research (see Section 9.3.2.4).

9.3.2.3 *Motivational Dimensions*

The BCQ operationalised motivation to change with respect to youth-reported behaviour (YRB) and teacher-reported problems (TRP). Across both behavioural dimensions, motivation was assessed through the youth-report BCQ. As described in Chapter 6, a teacher- or observer-report assessment of motivation to change was not supported and contraindicated for further consideration in this research. For both the TRP and YRB behavioural dimensions, motivation to change measures were constructed for the total measure and sub-factors. The steps taken to assess the internal validity of the BCQ's motivation measures is discussed in detail in Chapter 6 (see Section 6.3.5.3).

The YRB-MTC and TRP-MTC constructs (Total scale and subscales) demonstrated different correlational patterns with constructs conceptually related to offending, educational engagement and wellbeing. While both constructs are strongly correlated, their independence appears a function of their content focus: “youth assessed behaviour” for the YRB-MTC and “teacher-report problems” for the TRP-MTC. Further analyses (multiple regression) are required to identify the individual predictors of both constructs. This will support the refinement of the construct definitions and better assess their individual utility across research and applied settings.

Chapter 4 suggests that motivation to change may vary as function of (1) behavioural frequency, (2) intrapersonal versus interpersonal impact, (3) problem comorbidity, (4) behaviour and symptom sub-factors, and (5) problem and its context. Following a review of the literature, Casey et al. (2005) indicated that the TM was a weaker model for behaviours that are infrequent, interpersonal in nature and not clearly identified. To the researcher's knowledge, this viewpoint has not been empirically tested nor validated.

Given this context, through the design of the BCQ there was a high risk that motivation and behavioural type would become confounded in the assessment tool. Chapter 6

reports that this risk is significantly reduced when the assessment of motivation to change is restricted to the sub-factors. However, given it was beyond the scope of this research to conduct a more detailed assessment of intra-factor variability, specific to motivation to change, the BCQ's motivation to change measures are currently described as providing a "generalised" assessment of motivation. The BCQ's composite measures (YRB-MTC-Total and TRP-MTC-Total) require very cautious use, given they strongly confound motivation and behavioural type.

The BCQ also assessed the motivational construct of youth problem awareness (YPA) through a composite measure applying item-level data from both the youth and teacher-report BCQ. Problem awareness is a central feature of both the TM (Prochaska et al., 1992) and a number of motivation to change measures (e.g., RCQ; Miller & Tonigan, 1996), and it remains an important focal point of intervention (Becan et al., 2015; Casey et al., 2005; Day et al., 2006; French et al., 2003). While preliminary evidence for construct validity was found, the internal validity of the YPA measure is questioned on two grounds. First, composite measurements (variables developed from self- and observer-report measures) run the risk of magnifying instrument measurement errors, given that errors in both tools interact and aggregate with one another (Furr, 2011). Second, as noted in Chapter 4 (Section 4.7.1), motivation to change varies as a function of behaviour. Given the conceptual alignment between problem awareness and motivation (e.g., Prochaska et al., 1992), it is reasonable to assume that variability in problem awareness can be explained by behaviour type. The limitations of the YPA measure are also raised in Section 6.3.1.4. It is recommended that an item and factor-specific analysis of the YPA construct is conducted, with convergent and discriminant validity assessed.

9.3.2.4 *Summary and Future Analysis*

The operationalisation of the TM to a mainstream school context represents a unique contribution to the literature. Strong psychometric evidence is found supporting the BCQ's behavioural dimensions. The research offers emerging evidence to support the BCQ's motivational dimensions, specifically to the assessment of "generalised" motivation related groupings of conceptually or empirically related behaviours (identified by students) or problems (identified by teachers). Further item- and factor-specific analysis is required to assess the utility of the youth problem awareness (YPA) construct developed within this research. The following points suggest areas of further data-analysis and research specific to the BCQ. Areas of focus include:

- Assessing the psychometric utility of employing a Likert, as opposed to a Guttman, measurement scale.
- Exploring the construct of youth problem awareness at the individual behaviour level by conducting item-level analysis of the TRP and YRP variables, and isolating constructs that predict concordance between the two measures.
- Assessing single versus multiple behaviours being selected on a TRP or YRB sub-scale, and the association with functional impact.
- Developing factor-level measures for YPA, and assessing construct and discriminant validity.
- Conducting multiple regression with motivation to change as a dependent variable, and isolating independent predictor variables (e.g., attitudes to teachers, intrinsic values, number of problems/behaviours, offending risk) for both the TRP and YRB measures.
- Exploring the operationalisation of motivation to change at the item level (or single behaviour or problem).

- Operationalising readiness for change as a dichotomous variable (high versus low) and conducting cross-sectional correlational analysis of motivation for different participant groups.
- Assessing the concurrent validity of the BCQ (e.g., through the Contemplation Ladder, URICA).

9.3.3 Statistical Methods

As extensively detailed in Chapters 6 and 7, a number of assumptions and decisions were brought to the scale development process and the statistical analyses reported in this thesis. Some of these points have the potential to impact on the internal and external validity of the conclusions drawn. The key threats are briefly summarised as follows.

- As discussed in Section 7.3.6.1, there are two confounds that impact on the assessment of the longer-term behavioural outcomes related to school attendance and behaviour. They include program timing and the imputation of posttest missing data. Chapter 7 argues that both confounds have been reduced, but not fully eliminated. Therefore, the longer-term behavioural outcomes reported in this research are best described as indicative trends.
- The external validity of the motivation to change (MTC) measures is restricted to participants where there is either a youth-reported behaviour (YRB) or teacher-reported problem (TRP) present at both the pretest and posttest assessment points. The analyses do not include youth where behaviours may have improved over the intervention period (e.g., behaviours or problems present at the pretest, but not at the posttest), or where there is evidence of a new behaviour or problem (e.g., behaviour or problem not reported at pretest, but occurring at the posttest).

- Chapter 7 raises questions in terms of the internal validity of the MTC outcome analyses. Given the analyses excluded a number of participants (for the reasons cited in the above point), and the PSM models were developed prior to participants being excluded, it is possible that the Operation Flinders and control groups may have become non-equivalent through the exclusion process. This threat has been reduced through Chapter 8 not reporting MTC analyses where there is a statistically significant difference between the Operation Flinders and control group on the pretest MTC measure. However, given the equivalency between the Operation Flinders and control group participants cannot be accurately assessed for the MTC outcome measures reported in Chapter 8, this remains a limitation of the current study.

9.3.3.1 Propensity Score Matching (PSM)

PSM is a widely recognised and validated technique to address the non-equivalence of the control group (Little & Rubin, 2000). In total, 71 covariates were applied as balance covariates across five PSM models. Given these variables were included in the study because of their conceptual and empirical relationship to offending (see Table 2.1), educational engagement (see Table 2.2) and wellbeing (Table 2.3), there are strong grounds to conclude that for all PSM models (apart from the educational disengagement risk group), equivalence has been achieved and internally valid outcome analyses supported.

As reviewed by Caliendo and Kopeinig (2005) and Austin (2011), researchers conducting PSM are continually engaged in a trade-off between variance and bias in PSM model development. The three PSM models related to the offending, educational disengagement and wellbeing risk groups demonstrate strong external validity, however, the use of the *with replacement* algorithm has significantly reduced sample variance, and this raises questions regarding the internal validity of the modelling. Therefore, the pattern of

small behavioural outcomes found with the offending risk group needs to be interpreted with this caveat.

9.3.3.2 Power

Statistical power was an important research design consideration (see Chapter 5). It is strengthened through increased sample size and by reducing measurement errors in predictor and outcome variables (Lipsey, 1990; Oakes & Feldman, 2001). In the research design, the alpha significance was set at .05 and a medium effect size ($d = 0.5$) was sought. Applying Cohen's (1992) conventions, a minimum of 64 cases was required in both the treatment and comparison groups. This minimum number of cases was not achieved for the three stratified groups for two reasons. First, the risk profile of the sample cohort was lower than had been expected and was not congruent with previous evaluations (Raymond, 2003). Second, the research planning did not anticipate the possibility that in the PSM modelling some participants would be discarded. For the reasons noted, the study did not have sufficient power (or sample size) to detect medium effects for the stratified risk groups. Furthermore, given the program effects clustered on the small effect range, even with the desired sample size, the research was insufficiently powered to rule out Type 1 errors.

9.4 Summary Conclusions: Bringing it Together

To quote Section 9.2.3:

This research provides no conclusive empirical evidence that the Operation Flinders program is a catalyst for change for young people at risk of future offending, educational disengagement or poor wellbeing. However, this statement must now be assessed in terms of a critical review of the internal and external validity of the study methodology, the instruments applied and the statistical analyses undertaken.

The following section brings attention to this latter point.

In summary, the study has a number of strengths. These include the inclusion of psychometrically robust measures, external validity for the stratified analyses, and internally valid outcome analyses through the PSM matching of control and treatment groups. The significant threats to the study's internal validity include:

- Testing effects, specifically variations in instrument implementation and timing across the 59 research sites.
- The inability to control program fidelity, both within the delivery of the wilderness-program, and across the pre- and post-program phases.
- The lack of equivalency between the treatment and control group specific to youth at high risk of educational disengagement
- The reduced variance related to the PSM models applying matching with replacement, but with particular relevance to the offending, educational disengagement and poor wellbeing risk groups.
- Insufficient power to assess small to medium program effects, notably for the offending risk group.

Overall, the research provides optimism that the Operation Flinders program may be delivering small program effects (clustering on behavioural outcomes) for a key target group (youth at risk of offending). Program outcomes for young people at risk of educational disengagement are less conclusive, but if they are occurring, they are most likely to be within the small to negligible range. However, for youth at risk of poor wellbeing, there is no consistent evidence of program impact. These summary outcomes need to be interpreted in light of two key issues that impacted on the internal validity of the study: (1) the lack of standardisation of testing procedures and (2) the inability of the study to assess and monitor program fidelity.

The lack of strong program impact raises two important points. First, can a broad-based intervention like the Operation Flinders program address the needs of a heterogeneous sample of young people presenting with risk factors related to future offending educational disengagement and poor wellbeing? Given each risk cohort presents with different needs, there is a strong argument that nuancing the program to the specific needs of a single cohort group will translate to stronger program impact (Andrews & Bonta, 2010a). Second, the study found only small effects for group level change. Changes occurring at the individual participant level may translate to notable benefits for individual young people concerned. The future assessment of individual level change remains an area of proposed research direction (see Section 9.4.4).

9.4.1 Operation Flinders

This section briefly integrates the current findings with historical quasi-experimental program evaluations of the Operation Flinders program (see Section 3.5.4). Mohr et al. (2001) found that youth demonstrating the highest level of need (e.g., scoring in the negative half of the scale) gained moderate to large effects on outcomes specific to self-esteem, anger (reduction), criminal cognitions and classroom behaviour. Meanwhile, Raymond (2003) found a pattern of similar effects that clustered within the small to moderate range. He found that a student's risk of educational engagement (operationalised as school marginalisation) was a predictor of stronger program impact or effect size. Consistent across both evaluations, including the current study, is that youth presenting with risk factors associated with future negative behavioural outcomes (e.g., offending, educational disengagement) are most likely to benefit from the Operation Flinders program. In comparison to the previous quasi-experimental evaluations (Mohr et al., 2001; Raymond; 2003), the current study found a pattern of smaller intervention effects. It is possible that this smaller pattern may be due to the rigorous PSM employed in the current study (resulting in Operation Flinders and control

group equivalency). Both Raymond and Mohr et al. reported evidence indicating small differences between the Operation Flinders and control group participants in terms of risk profile and/or pretest scores. Thus, it is possible that higher intervention effects noted in the previous studies may be due, in part, to the lack of equivalency between groups.

An argument could be made that the small and non-significant intervention effects were a function of program composition. Compared to residential programs within North America, which may be up to three months in duration (see Outdoor Behavioral Healthcare; Russell, 2003), the Operation Flinders program represents a relatively brief intervention. Therefore, the dosage of intervention may not be sufficiently high enough to both initiate and consolidate change. This raises the possibility that the wilderness intervention may have greater utility as an assessment tool, as opposed to a stand-alone intervention. While the assessment function offers merit (Kimball, 1993; Russell, 2000), across the literature, program length has not been reliably associated with higher intervention effects. For example, in a meta-analysis restricted to youth-at-risk, longer programs (over 10 weeks) were associated with smaller intervention effects (Wilson & Lipsey, 2000). In contrast, a meta-analysis by Cason and Gillis (1994), restricted to an adolescent cohort, found the opposite relationship. A comprehensive meta-analysis by Bowen and Neill (2013) found no relationship between program length and intervention outcomes. In summary, there is limited support for the argument that program length is associated with the smaller effects noted within this study.

9.4.2 “Catalyst for Change” Descriptor

The “catalyst for change” descriptor was operationalised in this research as a process and outcome of change (see Chapter 4). It is concluded that this descriptor appears to have most relevance to young people at risk of offending. However, overall, the research does not

offer strong *empirical* support for its use. Chapter 10 argues that the descriptor may continue to offer significant heuristic value.

The research operationalised the catalytic properties through the TM. This model has been applied by a number of North American researchers within process and outcome evaluations of clinically focused wilderness programs for involuntary youth with severe substance abuse problems (Bettmann et al., 2013; Russell, 2008; Tucker et al., 2015). Specifically, Russell (2008) found that motivation to change, as assessed through the URICA, increased over the wilderness intervention period (corresponding to an increasing percentage of youth transitioning to the “action” stage of change). Therefore, given this empirical support, the operationalisation of the TM to the wilderness-adventure modality remains supported. However, to assess the generalisability of the TM model across the wilderness discipline, there is a need for research to be directed to different problem types (e.g., offending), participant cohorts (e.g., voluntary) and program contexts (e.g., outside North America).

9.4.3 Cross-Intervention Meta-Analytic Comparisons

This section briefly compares the results of the research with meta-analytic studies of wilderness, psychotherapeutic and forensic interventions that have a skill-building focus for young people (defined as asset building programs in Chapter 2). In terms of wilderness programming, across the meta-analyses, intervention effects cluster on the medium effect size ($0.4 < d < 0.5$) (Bowen & Neill, 2013; Neill, 2003; Norton et al., 2014). Norton et al. have identified this as the benchmarked effect size for outdoor-wilderness programs²⁸. However, Bowen and Neill note that effect sizes between 0.3 and 0.5 are more typical for programs targeting 9 to 17 year old cohorts.

²⁸ Cohen’s *d* (effect size) is a standardised measure of the difference between two means. Small, medium and large effect sizes are denoted by $d = .20$, $d = .50$ and $d = .80$, respectfully (Cohen, 1992).

In relation to the broader literature, there is wide variation in program effects for cognitive behavioural skills programs targeting psychological and behavioural outcomes in young people, specific to (1) offending ($d = .30$, Redondo et al., 1999), (2) anger ($d = .67$, Sukhodolsky et al., 2004), (3) antisocial behaviour ($d = .48$, Bennett & Gibbons, 2000) and (4) anxiety ($d = .98$, James et al., 2013). In a landmark meta-analysis, Durlak et al. (2011) found that social and emotional skill development programs delivered within school settings had an effect size spread between $d = .22$ for conduct-orientated behavioural outcomes to $d = .57$ for social and emotional learning outcomes.

Collectively, the previous reviews suggest that the outcomes associated with asset building programs for youth-at-risk cluster on the small to medium effect size, with evidence suggesting that program effects narrow or become slightly smaller for outcomes related to conduct, offending and antisocial behaviour. Based upon the assumption that the results contained in this thesis are valid and reliable, this research suggests that the Operation Flinders program may be operating below benchmarked levels of program impact (or effectiveness). Chapter 10 provides a strong argument that Operation Flinders program impact can be strengthened through bringing attention to key program development activities.

9.4.4 Contextualising the Study and Future Research Directions

As discussed in Chapter 2, this study was embedded within an ecological model, which seeks to understand behavioural functioning as the interaction between a young person's presentation/needs and their social, family, school, community and cultural environments (Bronfenbrenner, 1977, 1992; Bronfenbrenner & Ceci, 1994; Huston & Bentley, 2010; Sameroff, 2010). The study brought a restricted focus to proximal assets (e.g., skills, attitudes, values and/or behavioural traits) that have an empirical or predictive relationship with reduced offending risk, increased educational engagement or enhanced wellbeing. This restricted focus is a notable limitation of the study, as variations in offending,

educational engagement and wellbeing outcomes are dependent on the interaction between both proximal and distal factors (Lerner et al., 2005; Lerner, Lerner, von Eye, et al., 2011). This limitation can be equally directed to the design of the Operation Flinders program. The program lacks a coherent description of the mechanisms by which ecological factors (e.g., family, school) support and consolidate post-program change. There is a strong argument that the catalytic effects of intensive wilderness programs may only be realised through post-program supports and ecological embedding. For example, family members' cueing, reinforcing and encouraging the consolidation of motivational processes that have been elicited within the wilderness program. This point is further discussed in Section 10.3.3.

Given the limitations identified within the study, the following future research directions are suggested:

- A retrospective study assessing the reasons Operation Flinders and control group participants left school (e.g., for education, job pathways) in the post-program phase. These reasons were confounded in the current study.
- A qualitative research methodology to disentangle the interaction between behavioural type, participant presentation and motivation to change for participants attending intensive wilderness programs. A long-term follow-up of participants (from the current study) using electronically available and de-identified offending, police, educational, medical and welfare data (data-linkage).
- Employing a mixed method approach that assesses the interaction between broad-based family (e.g., parenting styles), community (e.g., crime rates) and school (e.g., school culture) factors, and wilderness program outcomes and post-program functioning.

- Integrating parent or caregiver observational assessment measures within future evaluation.
- Assessing individual level change through case-study analysis.
- Conducting a longitudinal qualitative assessment of post-program attitudinal and behavioural functioning of program participants (thereby assessing the presence and mediators of post-program behavioural regression).
- Contracting research assistant staff to support and monitor research implementation quality and integrity across multiple remote sites (to address testing effect confounds).

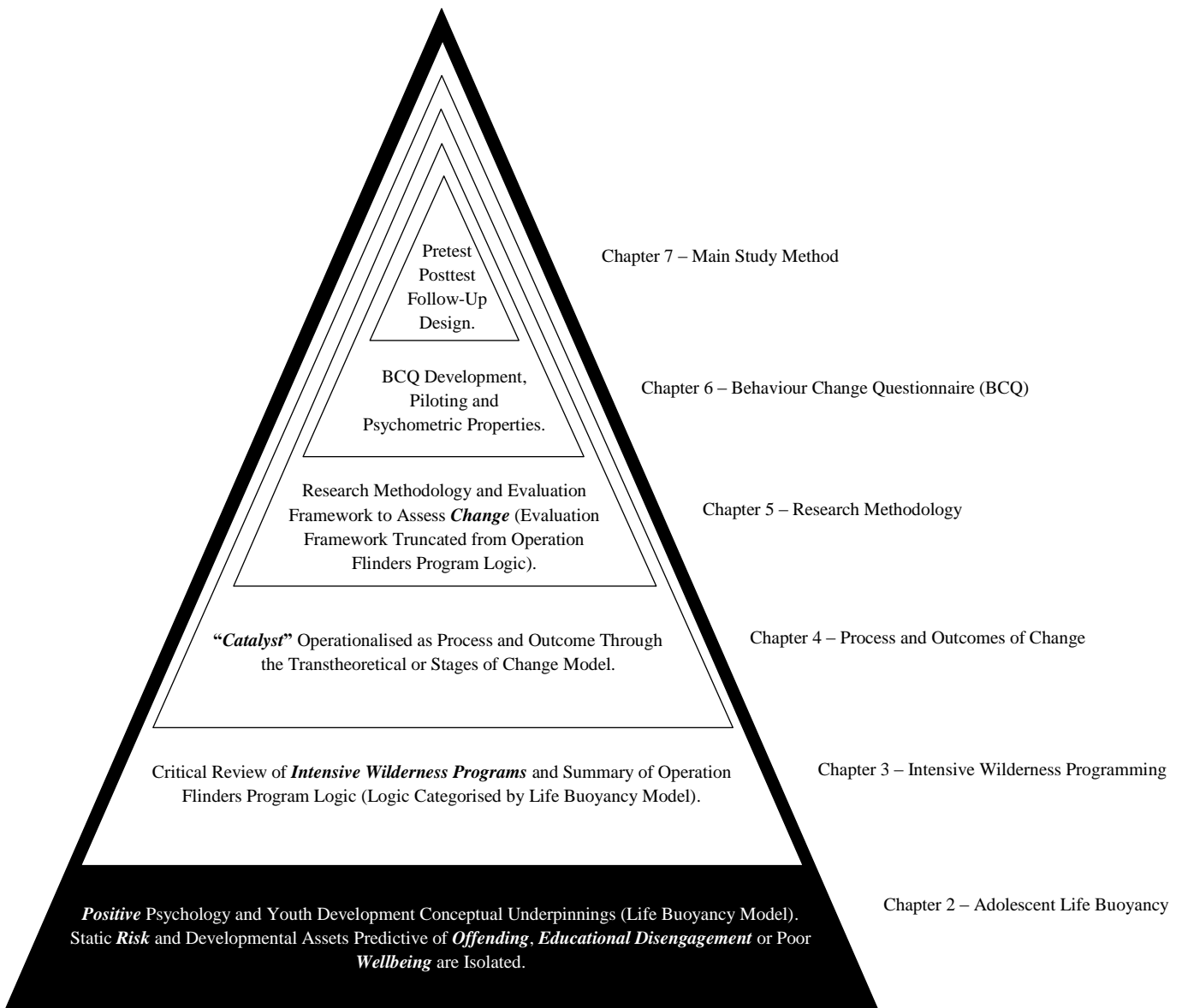
9.5 Chapter Summary

The chapter has critically reviewed the research results, with consideration to the internal and external validity of both the research methodology and the Behaviour Change Questionnaire. Two central issues have impacted on the internal validity of the study: (1) the lack of standardisation of testing procedures and (2) the inability of the study to assess and monitor program fidelity. While acknowledging these points, this research does not offer strong empirical support for the “catalyst for change” descriptor as it relates to intensive wilderness programs for young people at risk of offending, educational disengagement and poor wellbeing.

Chapter 10

Can *intensive wilderness programs* be a *catalyst* for *positive change* for young people at *risk* of future *offending, educational disengagement* or poor *wellbeing*?

Chapter 8 – Results
 Chapter 9 – Discussion
 Chapter 10 - Conclusions



10 Conclusions

The aim of this chapter is to integrate the research results and key themes into the broader positive psychology and youth development literature. The chapter also critically reviews the Operation Flinders program against best-practice principles of youth programming (Chapter 2) and discusses the potential role of frameworks (e.g. Life Buoyancy Model) to support conceptually sound program development and high fidelity program implementation. The chapter finishes by arguing that there is much heuristic value to continue to use the “catalyst for change” descriptor for intensive wilderness programming for youth-at-risk cohorts. Specifically, this heuristic value is supported if the descriptor brings research and applied attention to three key constructs: (1) problem awareness, cognitive intention and behavioural activation (2) treatment readiness and (3) maintenance.

10.1 Strengthening Program Impact

Chapter 9 suggests that the Operation Flinders program may be operating below benchmarked levels of program impact (or effectiveness). This section reviews the Operation Flinders program against the five principles of high-impact youth programming identified in Chapter 2 (Section 2.4): conceptually sound, skill-focused, targeted, responsive and program integrity. They are considered in turn:

10.1.1 Conceptually Sound

Conceptually sound programs have clear aims and objectives (Sallybanks, 2003); they describe the relationship between program processes and outcomes; and they are founded upon a clear program logic or program theory that is informed by empirical evidence (Bamberger et al., 2012). Operation Flinders has a clear set of program aims and objectives, and there is an endorsed program logic and theory for its Northern Territory program

(Raymond & Lappin, 2015), with a nuanced version of this logic and theory recommended for the South Australian delivered program.

10.1.2 Skill Focused

Programs that are skill-focused have clearly articulated social, cognitive, behavioural and emotional competencies at the focus of intervention and activities, strategies and processes that are connected and coordinated to deliver these outcomes (Durlak et al., 2011). A meta-analysis by Wilson and Lipsey found that wilderness challenge programs for youth-at-risk that included therapeutic enhancement techniques, for instance, skill orientated cognitive/behavioural techniques, demonstrated the largest effect sizes or program impact. The Operation Flinders program has clearly articulated social, cognitive, behavioural and emotional competencies at the focus of intervention (articulated in a program logic), but the degree program facilitators deliver activities, strategies and processes and that are connected and coordinated to deliver these outcomes remains unknown.

10.1.3 Targeted

This principle states that program impact is maximised when the intervention is targeted to young people whose psychological or behavioural presentation (or risk factors) is consistent with the intended outcomes of the program (Andrews & Bonta, 2010a; de Vries et al., 2015). Participant selection has been identified as a key challenge in the implementation of wilderness programs for heterogeneous cohorts of youth-at-risk (Raymond & Lappin, 2011; Raymond & Lappin, 2015). In this thesis, the researcher replicated a number of static risk assessment measures applied in a previous evaluation (Raymond, 2003). Across the 2013 evaluation cohort, Operation Flinders participants reported substantially lower levels of static risk factors compared to 2003. To illustrate, in 2003, 70.0% of participants reported truanting from school in the month prior to attending the Operation Flinders program, while in 2013, this figure was 34.7%. Although it is possible that sampling errors may explain some of this

variation (e.g., reduced truancy rates between 2003 and 2013), an argument could also be made that the risk profile of the Operation Flinders cohort has reduced over this period. In short, if a program includes young people whose risk or need factors do not match the intended outcomes of the program, then collective program impact will be reduced. Therefore, participant selection and targeting would appear an important area of ongoing monitoring for the Operation Flinders program. Assessment measures integrated within this research, specifically, the Behavioural Change Questionnaire (Teacher-Report), may offer utility within the Operation Flinders pre-program assessment processes.

10.1.4 Responsive

Programs that seek to understand the factors that engage, positively challenge and motivate young people, and then tailor program delivery to these aspects, are in the best position to deliver meaningful program outcomes (Antonowicz & Ross, 1994; Durlak et al., 2011). These programs are “responsive” in how they deliver their content. A strength of wilderness-adventure programs is their capacity to engage youth-at-risk within a predominately fun, novel and interesting experience, and through this process, be a catalyst for prosocial attitudinal or behaviour change (Berman & Davis-Berman, 1991). There is strong evidence that the Operation Flinders program can engage young people in fun, playful and challenging activities (Raymond, 2003; Raymond & Lappin, 2015), and therefore, uphold this principle. At face value, this appears to be a strength of the wilderness-adventure modality.

10.1.5 Program Integrity

Programs with high program integrity (or fidelity) are implemented as intended and designed at the practice layer (e.g., teacher, practitioner, facilitator); minimise program “drift” or ad hoc changes to program implementation or design (Mertens & Wilson, 2012); have clearly defined program elements and processes (Goldkamp, 2010); and bring planning

and monitoring to implementation (Durlak & DuPre, 2008; Fixsen et al., 2009). Across the wilderness literature, many programs demonstrate low program integrity or fidelity (Tucker & Rheingold, 2010), and leaders within the discipline have identified this as a key area of focus for the design and implementation of wilderness-adventure programs for young people (Norton, Tucker, Russell, Bettmann, Gass, & Behrens, 2014). There is a range of challenges in upholding program integrity for wilderness programming; given it is a dynamic relationship-orientated intervention conducted in a remote setting (see Raymond & Lappin, 2015). While an argument has been made to standardise the implementation of the intervention through operational procedures (Berman & Davis-Berman, 2001), the practical implications of such a suggestion remain uncertain. In short, program integrity remains a key focus area for the Operation Flinders program (Raymond & Lappin, 2015, 2016).

10.1.6 Summary

In respect to these principles, a strong argument can be made that the impact of the Operation Flinders program can be strengthened through attention being paid to: (1) participant selection, (2) program integrity (supported by the articulation of a nuanced program logic for the South Australian program) and (3) operationalising skill development processes within the program. It is worth highlighting that the Operation Flinders program is not alone in this endeavour. Meta-analytic studies indicate that there are significant variations in the degree youth programs uphold one or more of the aforementioned principles (e.g., DuBois, Holloway, Valentine, & Cooper, 2002; Durlak et al., 2011; Lipsey, 2009).

10.2 Positive Psychology and Life Buoyancy as a Conceptual Framework

This research has been conceptually inspired by the integration of positive psychology (Seligman, 2002; Seligman & Csikszentmihalyi, 2000) and developmental constructs (Bronfenbrenner & Ceci, 1994), as operationalised through the Positive Youth Development movement (King et al., 2005; Lerner et al., 2003; Lerner, Lerner, von Eye, et al., 2011). In

particular, it has brought a conceptual focus to the “development assets” underpinning prosocial behaviour, educational engagement and wellbeing outcomes (see Section 2.3.1), as categorised under the constructs of awareness, skills and mindset of the Life Buoyancy Model (see Section 2.5). This thesis introduced and presented a background case example (not tested nor validated in this research) demonstrating how positive psychology and developmental constructs can be operationalised into program development and evaluation across offending, educational and wellbeing contexts through a conceptual framework (Life Buoyancy Model). The previous section has highlighted the importance of conceptually sound program development and implementation. However, one can argue that this should occur in a manner where program developers can bring autonomy, creative flair and innovation to program design and implementation. There is emerging evidence that the Life Buoyancy Model can support these two endeavours (Raymond & Lappin, 2015, 2016), however, further empirical validation is required.

Given the operationalisation of positive psychology constructs for adolescent cohorts remains significantly underdeveloped (Norrish & Vella-Brodrick, 2009), this research brings important attention to this area. However, the research identifies a barrier to the integration of positive psychology into behaviourally focused contexts (e.g., youth offending). As discussed within Chapter 5, there continues to be a heavy reliance on measures that operationalise deficit-based constructs (e.g., “identification with criminal others”) within some disciplines (e.g., forensic psychology). Given these measures have been validated for their context (e.g., youth offenders), there is a need for the positive psychology movement to operationalise and validate strength-based constructs across these behaviourally focused settings.

10.3 “Catalyst for Change” Descriptor and Its Heuristic Value

This research did not find strong empirical support for the use of the “catalyst for change descriptor” as applied to intensive wilderness programming for youth-at-risk. On this

basis, should researchers, practitioners and program marketers abandon this descriptor? The following section argues that this may be a premature suggestion.

As detailed in Chapter 4, the “catalyst for change” descriptor was defined as both an actual change (outcome), and the process (including actions and triggers) of supporting or increasing the probability of future change. These process and outcome components were operationalised through the Transtheoretical Model (Prochaska et al., 1992); a model that has been described as an “every person (sic)” theory (Prochaska & Velicer, 1996) and offering high levels of heuristic value across multiple research and applied settings (Littell & Girvin, 2002). Picking up on this theme, can the “catalyst for change” descriptor also offer heuristic and applied value, and support the integration of research and practice across the wilderness discipline? In this context, heuristic value refers to an efficient cognitive process or mental short-cut that can support researchers and practitioners operationalise the foundational content of the construct. Prior to answering this question, three key themes overlapping the behaviour change, wilderness and forensic literature are discussed: (1) problem awareness to cognitive intention to behavioural activation, (2) treatment readiness and (3) maintenance. They are considered in turn.

10.3.1 Problem Awareness to Cognitive Intention to Behavioural Activation

As detailed in Chapter 4, and assessed through the Behaviour Change Questionnaire (BCQ, Chapter 6), this research operationalised motivation to change as a continuous variable that includes the following four constructs:

- No problem awareness or recognition.
- Problem awareness and recognition (problem awareness).
- A cognitive or thought driven intention to change (cognitive intention).
- Activation of a behaviour aligned to a change process (behavioural activation).

These constructs were developed with consideration to the TM (Littell & Girvin, 2002; Prochaska et al., 1992), and bring focus to the role of human agency (Bandura, 2001, 2002), or forethought, motivation, cognition, self-regulation and self-awareness to elicit intentional change. This research finds that youth-at-risk vary in their preparedness to change as operationalised across these constructs, with emerging evidence that the BCQ can reliably assess this variation. Furthermore, the constructs of problem awareness, intention and behaviour change also represent qualitative outcomes of intensive wilderness programming for youth-at-risk (Raymond & Lappin, 2015, 2016). Given this, and the empirical support for these constructs within the behaviour change literature, they have particular relevance to wilderness-adventure program developers, practitioners and researchers. They warrant further review, operationalisation and assessment within the wilderness-adventure literature.

10.3.2 Treatment Readiness

Australian researchers have operationalised the TM into a construct titled “treatment readiness” (see Section 4.4.2) (Day et al., 2006; Day et al., 2007; Ward et al., 2004). Specifically, Day et al. (2006) have suggested that offender rehabilitation programmes need to consider the “process of change” or the readiness of offenders to undertake interventions. Day et al. have suggested that offender management programs consider pre-intervention programs and activities to build treatment readiness. To take this one step further, an argument can be made that intensive wilderness programs can build treatment readiness (or responsiveness) for the delivery of more explicit and action orientated interventions (e.g., cognitive behavioural therapy, clinical services). Preliminary evidence for this viewpoint is provided as follows.

In two qualitative reviews of Australian-based intensive wilderness programs for youth-at-risk, Raymond and Lappin (2015, 2016) found that for a selection of young people the intervention had a central role in supporting young people engage with post-care

clinically orientated services (e.g., drug and alcohol counselling, mental health treatment). In other words, the intensive wilderness program became a catalyst for the uptake of post-care professional treatment. Across North America, the Outdoor Behavioral Healthcare movement has integrated wilderness therapy program components with clinically focused substance abuse treatment (Russell, 2008). There is emerging evidence that the wilderness-adventure components are a central driver for building treatment readiness for action orientated clinical services within this intervention (Russell, 2003; Russell, 2008). In summary, treatment readiness is a construct that appears to have significant relevance to wilderness-adventure program developers, practitioners and researchers, and warrants further interest in the literature.

10.3.3 Maintenance

Chapter 3 identified that a key challenge to the wilderness discipline was the maintenance and consolidation of participant outcomes, with post-program follow-up a key program component of “successful” programs (Brand & Smith, 1999) and a best-practice criterion for wilderness-adventure programming more generally (AIC, 2006; Raymond, 2014). Across the wilderness-adventure literature there is little prescriptive guidance in terms of the design or delivery of post-care follow-up or maintenance interventions. Raymond (2014) suggested that post-program follow-up “should be guided by a program logic model, that extends from the wilderness experience through a consistent narrative (or story), as well as continuous adult relationships” (p. 23). Within the forensic literature, the concept of “maintenance programmes” has gained increasing attention within offender rehabilitation, specifically as a mechanism to consolidate intervention outcomes (see review by Day & Casey, 2010). Given the importance of program maintenance to wilderness-adventure program developers, practitioners and researchers, it warrants stronger conceptual, applied and empirical review in the literature.

There is significant public and policy interest in the design and implementation of interventions that can positively moderate a young person's developmental trajectory towards future offending (Crowley, 2013; Deković et al., 2011), educational disengagement (Heckman, 2008) or poor health and wellbeing outcomes (Hamilton & Redmond, 2010). With this context in mind, this research highlights the importance of considering behavioural change as both an outcome and a process. That is, programs designed to build social and emotional competencies, skill development or respond to factors predictive of negative future outcomes should bring attention to the post-intervention consolidation and maintenance of change.

10.3.4 Heuristic and Applied Value

In summary, the previous sections have suggested that the constructs of (1) problem awareness, cognitive intention and behaviour activation, (2) treatment readiness and (3) maintenance have important relevance to wilderness-adventure program developers, practitioners and researchers. Therefore, given the “catalyst for change” descriptor is conceptually related to all three constructs, if its use brings strong attention to all three constructs in program design, implementation and evaluation, then it arguably retains a high level of heuristic and applied value.

10.4 Thesis Significance

This thesis is significant for the following reasons

- It represents the first systematic attempt to evaluate the effectiveness of an intensive wilderness program for youth-at-risk through the “catalyst to change” descriptor, and to operationalise the intervention through the Transtheoretical Model.
- It has developed, piloted and tested a tool, based upon the Transtheoretical Model, to assess a student's (1) recognition of aggressive, conduct and avoidant

behaviours, (2) problem awareness and (3) motivation for self-directed change within mainstream educational settings. While further validation of the motivational dimensions is required, there is significant optimism that the behavioural constructs can have both applied and research utility.

- To the author’s knowledge, it is the first time that propensity score matching (PSM) has been applied to address sampling bias (or a non-equivalent control group) within a quasi-experimental evaluation of an outdoor or wilderness-adventure program.
- This research has designed and tested a research methodology to assess the interaction between program outcomes and participant risk for future offending, educational disengagement and poor wellbeing. Assessing the moderating impact of participant characteristics is of particular interest to the discipline (Norton et al., 2014), and the methodology road-tested in this research may offer utility to operationalise this endeavour.
- It demonstrates how positive psychology constructs and modelling can be operationalised across program development and evaluation, as evidenced through the background case study of the Operation Flinders program.

10.5 Final Conclusions

In this research, I have systematically operationalised and assessed the empirical basis for the “catalyst for change” descriptor, as applied to intensive wilderness programs for youth-at-risk. While the empirical basis for this descriptor was not found, the heuristic and applied value of the descriptor remains tentatively supported. Specifically, this value lies in the descriptor’s potential to draw together the Transtheoretical Model aligned concepts of “treatment readiness”, “problem awareness”, “cognitive intention”, “behavioural activation” and “maintenance” into a narrative of wilderness-adventure programming that has relevance

to both research and practice. However, further conceptual and empirical work is required to validate the utility of these constructs. It is hoped that this research will inspire others to integrate theory and evidence to operationalise wilderness-adventure programming for young people at risk of offending, educational disengagement and poor wellbeing.

Appendices



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INFORMATION SHEET FOR EXPERTS

PROJECT: UNDERSTANDING THE PROCESSES AND OUTCOMES OF CHANGE

Dear Sir/Madam,

Ivan Raymond is a PhD student within the School of Education, Flinders University. His research is exploring how schools and youth agencies can improve educational engagement and student wellbeing outcomes for young people at risk of educational disengagement. He has developed a conceptual model for understanding and evaluating programs designed to increase young people's capacity for educational engagement. From 2012 to 2014 he will be exploring the utility of the model through a process and outcome evaluation of two locally delivered interventions for young people at risk of educational disengagement: (1) the Operation Flinders wilderness-adventure program and (2) a case management intervention embedded within schools.

The proposed model includes the integration of strength-based constructs (positive psychology) and child/adolescent developmental research and evidence. The model is designed to be inclusive of both scientific evidence and pragmatic program approaches. With this in mind, the project aims include for:

- The proposed model to have practical application to local government and non-government service providers;
- The tools developed within the model to demonstrate sound psychometric properties and utility for a cohort of young people at-risk of educational disengagement;
- Both the model, and individual programs, to be reviewed in a methodologically sound manner, where possible extraneous confounds are minimised and addressed.

To facilitate this objective, Ivan is seeking experts with specialist knowledge and experience who can provide independent opinion in following areas:

- The selection of constructs to be evaluated in the study;
- The development and review of the item pool of the self-report measures;
- The recruitment and selection processes attached to the participant and control group within the evaluation of individual programs;
- The interpretation of findings.

You have been identified as an expert with specialist knowledge and experience within one or more of these areas. Your involvement in this project is thereby requested. Through an exchange of emails with Ivan, you are free to decide the type and level of involvement relating to:

- The content areas of opinion;
- Your preferred method of providing opinion (e.g., face-to-face, email or phone);
- The time commitment you have available.

If you choose to be part of this project:

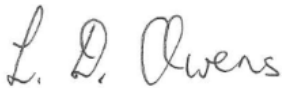
- You will not be identified within any reports or written dissertation that is produced from this study;

- All verbal (phone or face-to-face) opinion you provide will summarised in a return email and you will have the opportunity to review this information prior to its inclusion within the research project;
- Your information, name and identity will remain confidential;
- Your participation in this research is voluntary and you are free to withdraw from the project at any time and/or decline to answer particular questions;
- The decision to participate will in no way impact on your relationship with Flinders University, Department of Education and Child Development or any other external stakeholder involved in this project;
- There will be no payment for taking part in this project;
- The emails (and documentation) exchanged between you and Ivan will be securely kept for a period of seven years at Flinders University.

If you are willing to be part of this project, Ivan will make contact with yourself to negotiate the type and level of involvement. This will be confirmed through an exchange of emails with Ivan.

Please do not feel any pressure to be involved in this project. If you have any queries or concerns about the nature of the project, please feel free to contact myself on 82013356 or by email: larry.owens@flinders.edu.au.

Thank you for considering this request.



Professor Larry Owens
School of Education

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5705). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



CONSENT FORM

Understanding the Processes and Outcomes of Change

I (name) _____

Agree to my involvement in the research project entitled: “**Understanding the processes and outcomes of change**” being conducted by Ivan Raymond, 0417 846 103, ivan.raymond@flinders.edu.au.

I have read and understood the Information Sheet on the project and understand that I am being asked to participate by providing expert feedback relating to aspects of the project's design and implementation. Through an exchange of emails with Ivan Raymond, I have detailed (1) the content areas I am willing to provide expert opinion on, (2) the time commitment I am willing to provide to this project and (3) my preferred method of providing opinion (e.g., email, face-to-face, or phone). Furthermore:

- I understand that I may not directly benefit by taking part in this research.
- I understand that I will not be identified within any reports or written dissertation that is produced from this study.
- I understand that all verbal (phone or face-to-face) opinion I provide will summarised in a return email and I will have the opportunity to review this information prior to its inclusion within the project.
- I understand that all individual information will remain confidential.
- I understand that my participation in this research is voluntary and I am free to withdraw from the project at any time and or decline to answer particular questions.
- The decision to participate will in no way impact on my relationship with Flinders University, Department of Education and Child Development or any other stakeholder involved in this project.
- I understand that there will be no payment for taking part in this project.
- I consent to being involved in this project.

Signed: _____ Date: _____



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INFORMATION SHEET FOR SCHOOL PRINCIPALS

PROJECT: UNDERSTANDING THE PROCESSES AND OUTCOMES OF CHANGE FOR YOUNG PEOPLE AT RISK OF EDUCATIONAL DISENGAGEMENT AND POOR WELLBEING OUTCOMES

Dear Principal,

Operation Flinders has been providing a service to South Australian high schools for the last 20 years. Operation Flinders is committed to better understanding how it can improve its service delivery and program outcomes. In collaboration with Operation Flinders, former Operation Flinders team leader and Clinical Advisory Committee member, Ivan Raymond, is currently undertaking a PhD with the School of Education, Flinders University. Over the course of 2012-14 he will be evaluating the processes and outcomes of change for young people attending the Operation Flinders program.

As part of this evaluation process, students from your school will be asked to participate in the evaluation during their involvement in the upcoming Operation Flinders program. The study includes the following features:

- *Parents/Caregivers will be sent an Information Sheet about the research and are requested to give written consent for their child's participation.*
- *Students that have been selected to attend the Operation Flinders program in September 2012 will be requested to complete a brief questionnaire during their time on the Operation Flinders program.*
- *The questionnaires will ask students about how they see their problems, their relationships with others and their strengths.*
- *Teacher(s)/school counsellor(s) coordinating your school's involvement in the Operation Flinders program in September 2012 will be asked to assist the researcher to facilitate students' participation in the study.*
- *The timeline for this phase of the study is from July to October 2012.*
- *The details of all students will be kept confidential and anonymity will be maintained throughout the research process.*
- *Information about the research project and consent forms will be sent to parents/caregivers and students.*
- *Participation is voluntary and students (and guardians) may withdraw their consent from the project at any time without it affecting their involvement in the Operation Flinders program.*
- *There are no foreseeable risks to students due to their involvement in the research project.*

This research has been approved by the Flinders University Social and Behavioural Ethics Committee, the Department of Education and Child Development Policy and Communications and Operation Flinders Clinical Advisory Committee.

Should you require additional information regarding this research process, please contact Ivan Raymond on 0417 846 103, or ivan.raymond@flinders.edu.au.

Your consent for this project to be facilitated at your school site is requested by return email.

Thanking you in advance,

Sincerely,

Ivan Raymond

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5705). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



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GUARDIAN INFORMATION SHEET

YOUR SUPPORT IS REQUESTED

Dear Parent/Caregiver,

Ivan Raymond is a PhD Candidate who is working alongside Operation Flinders to find ways to improve the program for young people who attend the program in the future. During your child's involvement in the upcoming Operation Flinders program, your child's involvement in the below research project is being requested.

Purpose of the project

The project is titled: "Understanding Operation Flinders" and is being supported by Flinders University's School of Education. The aim of the project is to support Operation Flinders better understand its program and the way program outcomes are being achieved, thereby enabling Operation Flinders to improve its future program delivery.

What your child will be asked to do?

Your child will be requested to participate by completing a short questionnaire that asks your child about how they see their problems, their relationships and their strengths. While completing the questionnaire, Ivan will seek your child's feedback about the questionnaire and your child's understanding of the questionnaire items.

What benefit will be gained by your child's involvement in this study?

Your child will not directly benefit or be paid from this study. However, your child's involvement in this project will support Operation Flinders improve the way it delivers its program in the future, thereby improving the outcomes obtained by young people who attend the program into the future.

Will my child be identifiable by being involved in this study?

The details of your child will be kept confidential and anonymity will be maintained throughout the project. Your child's name or identity will not be written or linked to any questionnaire or response provided.

Are there any risks or discomforts for my child?

Participation in this project is voluntary and you and/or your child may withdraw consent from the project at any time without it affecting your child's involvement in the Operation Flinders program or their schooling. Your child may answer 'no comment' or refuse to answer any questions at any time.

This research has been approved by the Flinders University Social and Behavioural Research Ethics Committee, the Department of Education and Child Development and Operation Flinders.

If you are happy for your child to take part, a Consent Form is attached for you to sign and return to your child's school. Should you require additional information regarding this research, please contact Ivan Raymond on 8201 5672, or ivan.raymond@flinders.edu.au

Thank you for considering this request.

Professor Larry Owens
School of Education

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5705). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



PARENTAL CONSENT FORM

Understanding Operation Flinders

Ibeing over the age of 18
years hereby consent to my child.....
participating, as requested, in the above project being conducted by:

Principal Researcher: Ivan Raymond, Phone: 8201 5672, Email: ivan.raymond@flinders.edu.au

I understand that (my child) is being asked to participate in the project by completing a questionnaire during their attendance on the upcoming Operation Flinders program. While completing the questionnaire, Ivan will seek my child's feedback on the questionnaire's content.

- I have read the information provided. Details of my child's involvement have been explained to my satisfaction.
- I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
- I understand that:
 - My child may not directly benefit from taking part in this research.
 - My child is free to withdraw from the project at any time and is free to decline to answer particular questions.
 - While the information gained in this study will be published as explained, my child will not be identified, and individual information will remain confidential.
 - My child's participation in this research project is voluntary.
 - There will be no payment for my child taking part in this study.
 - Whether my child participates or not, or withdraws after participating, will have no effect on their relationship with their school or the Operation Flinders program and they are free to withdraw their participation at any time

I consent to my child being involved in this project.

Signed: _____ Date: _____



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PARTICIPANT INFORMATION SHEET

PROJECT: UNDERSTANDING OPERATION FLINDERS

Ivan Raymond is a student at Flinders University and is working alongside Operation Flinders to find ways to improve the program for young people who attend the program in the future. With this aim in mind, Ivan is requesting 20 minutes of your time to complete some short questionnaires.

- You are being invited to complete a questionnaire during your involvement during the upcoming Operation Flinders program. The questionnaire asks questions about any problems you may be experiencing at school. While completing the questionnaire, Ivan will seek your feedback about why you answered the questions in a certain manner and how you felt about the questionnaire overall. Ivan will take notes about your feedback.
- The questionnaires will ask about how you see your problems, your relationships with others around you and your strengths.
- Your answers to the questionnaire will remain anonymous or private from your teachers, Operation Flinders staff and other young people.
- At no time will your name or identity be linked to your answers or responses on the questionnaire.
- Your participation in the research project is voluntary and you may withdraw from the project at any time without it affecting your involvement in the Operation Flinders program or any part of your school curriculum.

If you are prepared to take part in this study, a Consent Form is attached for you to sign.

Should you require additional information regarding this research, please contact Ivan Raymond on 0417 846 103 or ivan.raymond@flinders.edu.au

Thank you for considering this request.

Ivan Raymond

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5705). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



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CONSENT FORM

PROJECT: UNDERSTANDING OPERATION FLINDERS

I (name) _____

Agree to my involvement in the research project entitled: **“Understanding Operation Flinders”** being conducted by Ivan Raymond, 0417 846 103, ivan.raymond@flinders.edu.au.

I have read and understood the Information Sheet on the project and understand that I am being asked to participate by completing a short questionnaire. While completing the questionnaire, I understand that Ivan will seek my feedback about why I have answered the questions in a certain manner and how I felt about the questionnaire.

- I understand that I may not directly benefit by taking part in this research.
- I understand that I will not be identified and all individual information will remain confidential.
- I understand that my participation in this research is voluntary.
- I am free to withdraw from the project at any time and or decline to answer particular questions.
- The decision not to participate will in no way affect my grades or relationship with my school or the Operation Flinders program.
- I am free to withdraw my participation at any time.
- I understand that there will be no payment for taking part in this study.
- I consent to being involved in this project.

Signed: _____ Date: _____

Confidential

Below is a list of behaviours which might occur at school. Please circle the number which best sums up how this behaviour relates to you. Please give your answers on the basis of how things have been for you over the last two weeks. There are no right or wrong answers.

	I don't do this behaviour	I do this behaviour, but I don't see it as a problem	This is a problem for me, but I don't want to do anything about fixing it	I am thinking about making changes to fix this problem	I am doing things now to fix this problem
Wagging school	1	2	3	4	5
Skipping classes	1	2	3	4	5
Refusing to attend school	1	2	3	4	5
Anger and aggression at school	1	2	3	4	5
Not following teacher's directions	1	2	3	4	5
Refusing to do work in lessons	1	2	3	4	5
Leaving classes early	1	2	3	4	5
Not doing homework	1	2	3	4	5
Attending school when you have used drugs or alcohol	1	2	3	4	5
Swearing at other students or the teacher	1	2	3	4	5
Giving up when work gets hard	1	2	3	4	5
Bullying other students	1	2	3	4	5
Using Facebook or a mobile phone during lessons	1	2	3	4	5
Coming to school really tired	1	2	3	4	5
Zoning out or daydreaming in lessons	1	2	3	4	5
Causing fights between other students	1	2	3	4	5
Not trying new school work if it looks hard	1	2	3	4	5
Other.....	1	2	3	4	5

For each of the following statements, please circle the number that describes you the best. Read each sentence carefully and answer honestly

	Disagree a lot	Disagree a little	Don't agree or disagree	Agree a little	Agree a lot
In most ways my life is close to the way I would want it to be	1	2	3	4	5
The things in my life are excellent	1	2	3	4	5
I am happy with my life	1	2	3	4	5
So far I have gotten the important things I want in life	1	2	3	4	5
If I could live my life over, I would have it the same way	1	2	3	4	5

If you were having a problem which was making your time at school difficult for you, how likely is it that you would seek help from the following people or sources?

Please indicate your response by circling the number that best describes your intention to seek help from each source that is listed.

	Extremely Unlikely	Unlikely	Likely	Extremely Likely			
a. Girlfriend or boyfriend	1	2	3	4	5	6	7
b. Friend (not related to you)	1	2	3	4	5	6	7
c. Parent	1	2	3	4	5	6	7
d. Other relative/family member	1	2	3	4	5	6	7
e. School teacher	1	2	3	4	5	6	7
f. School counsellor	1	2	3	4	5	6	7
g. Mental health professional (e.g., psychologist, social worker, counsellor)	1	2	3	4	5	6	7
h. Phone helpline (Kids Help Line)	1	2	3	4	5	6	7
i. Internet	1	2	3	4	5	6	7
j. Doctor/GP	1	2	3	4	5	6	7
k. Minister or religious leader (e.g., Priest, Rabbi, Chaplain)	1	2	3	4	5	6	7
l. I would not seek help from anyone	1	2	3	4	5	6	7
m. I would seek help from another not listed above (please list in the space provided) _____	1	2	3	4	5	6	7

Appendix F – Teacher-Report Questionnaire – Pilot Study

Below is a list of behaviours that might be seen by teachers and schools as a problem for students because they are having a negative impact on the student's: educational performance, school engagement or ability to reach their potential. Reflecting on the last two weeks, indicate whether or not you consider the behaviour as representing a problem for this student. If yes is marked, please indicate using your best judgement how the student currently relates to this problem. It would help us if you answered all items, even if you are not absolutely certain.

	From your perspective, does this represent a problem for the student? Yes / No	If yes, pick one response.			
		This is a problem for the student, but the student does not see it as a problem	The student sees it as a problem, but they are not willing to do anything about fixing it	The student has been talking about making changes to fix this problem	The student has been observed making changes to fix this problem
Wagging school	Yes / No	1	2	3	4
Skipping classes	Yes / No	1	2	3	4
Refusing to attend school	Yes / No	1	2	3	4
Anger and aggression at school	Yes / No	1	2	3	4
Not following teacher directions	Yes / No	1	2	3	4
Refusing to do work in lessons	Yes / No	1	2	3	4
Leaving classes early	Yes / No	1	2	3	4
Not doing homework	Yes / No	1	2	3	4
Attending school under the influence of alcohol or drugs	Yes / No	1	2	3	4
Swearing at other students or the teacher	Yes / No	1	2	3	4
Giving up when work gets hard	Yes / No	1	2	3	4
Bullying other students	Yes / No	1	2	3	4
Using Facebook or a mobile phone during lessons	Yes / No	1	2	3	4
Coming to school really tired	Yes / No	1	2	3	4
Zoning out or daydreaming in lessons	Yes / No	1	2	3	4
Setting up conflict between other students in the classroom	Yes / No	1	2	3	4
Not trying new school work if it looks hard	Yes / No	1	2	3	4
Other.....	Yes / No	1	2	3	4

On a scale of 1 to 10, how well do you know the issues and problems facing the student at school.

1 Not well at all 2 3 To a small degree 4 5 6 Moderately well 7 8 9 10 Very well



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INFORMATION SHEET FOR SCHOOLS

PROJECT: OPERATION FLINDERS EVALUATION

Dear Principal,

Brief Overview of Project

Operation Flinders has been providing a service to South Australian high schools and referral agencies for the last 20 years.

Operation Flinders currently receives funding support through the South Australian Attorney General's Department, and to maintain funding, Operation Flinders is required to undergo an independent evaluation in 2013. Operation Flinders was last evaluated in 2001 and 2003 (see <http://www.operationflinders.org.au/about-us/research>). In collaboration with Operation Flinders, Ivan Raymond is undertaking the evaluation as part of a PhD program with the School of Education, Flinders University. Essentially Ivan will be comparing young people who attend the program with young people who do not attend the program on a range of social, emotional, forensic, educational and wellbeing outcomes. For additional information on the current evaluation process and context, please go to <http://www.lifebuoyancy.org/operation-flinders-evaluation/>. Ivan is seeking to partner with your school to implement the evaluation process.

Requested Partnership Support

The success of the evaluation process is dependent on obtaining a large representative sample of both young people and referral agencies who attend and support Operation Flinders. Therefore, participant and stakeholder engagement remains a distinct challenge for the evaluation. Young people and their families are likely to have higher levels of trust and confidence in key school staff as opposed to external evaluators. Therefore, it has been identified that partnering with school staff within the evaluation process is the best mechanism to optimise engagement and the project's success. It is acknowledged that school staff have many things competing for their time and Ivan wishes to negotiate with your school regarding what support can be offered within this partnership process. Five requests are being made of all schools and agencies referring young people to a 2013 Operation Flinders program. They are as follows:

Step	Step Descriptor	Request
1.	Identification of Comparison Participants	Ivan will be requesting that your school identify young people who can be approached to enter the project as <i>comparison participants</i> – these are “young people who would have participated in the program if there were double the number of places available”.
2.	Disseminate and Collate Guardian Information Sheets and Consent Forms	Ivan will be requesting that your school staff disseminate Guardian Information Sheets and Consent Forms to young people attending Operation Flinders (<i>program participants</i>) as well as the <i>comparison participants</i> . Ivan will be requesting that your school maintains a register of returned forms and provides reminder cues to students to return forms (within the confines posed by your staff members' work roles and competing work pressures).
3.	Facilitate Contact with Key Observers for Pre- and Post-Program Questionnaire Completion	Ivan will be requesting that your school facilitate his contact with key teachers/counsellors/ school staff who could support the evaluation by being key observers within the project. The key observer will be requested to complete a 3-5 minute questionnaire on participants in the pre- and post-program periods.
4.	Facilitate Pre-Program Questionnaires	Ivan will be requesting that your school facilitate the completion of a 15-20 minute self-report questionnaire by both the comparison and Operation Flinders participants in the week before the start of your school's involvement in the program. These questionnaires can be returned in a stamped self-addressed envelope. Where possible, Ivan will make himself available to support the administration of questionnaires.
5.	Facilitate Post-Program Questionnaires	Ivan will be requesting that your school facilitate the completion of a 15-20 minute self-report questionnaire by both the comparison and Operation Flinders participants (six weeks after program completion). Where possible, Ivan will make himself available to support the administration of questionnaires. Ivan will also be providing the key observer questionnaires at this point too. These questionnaires can be returned in a stamped self-addressed envelope. At this point, Ivan will also be requesting the ED-ID numbers of all participants involved in the project.

Importance of Current Evaluation and Broader Wellbeing Research

Operation Flinders report that the proposed "evaluation remains central to meeting our current funding obligations with the South Australian government and further consolidating the long-term sustainability of the Foundation".

At a broader level, the information being collected within the study is tapping a range of constructs that underpin adolescent life buoyancy. This is a strength-based model of resilience and wellbeing dedicated to understanding and strengthening the key developmental processes and experiences that build children and young people's capacity to thrive within a modern and fast-paced world. It includes things such as problem awareness, self-efficacy, positive educational risk-taking, social and emotional skills, and constructive analysis of problems. In addition to supporting the Operation Flinders program, the project will provide significant information on how educational and wellbeing outcomes can be improved for young people at-risk of educational disengagement in South Australia, which has particular relevance given South Australia's educational and wellbeing strategic direction.

Feedback Available to You and Your Agency Personnel

It is understood that schools and youth agencies are extremely busy, and their personnel have many things competing for their time. Therefore, your school's time and commitment within this process is highly valued. In recognition of this, Ivan has sought to implement ways to help you understand and connect to the project, as well as provide ongoing and timely feedback about the project's findings. A webpage has been developed to provide a detailed overview of the research project, as well as provide links and resources to a range of topics that relate to adolescent life buoyancy, student wellbeing and wilderness therapy. For more information, please go to www.lifebuoyancy.org. If you would like to receive regular updates about the progress and findings of the project, you are invited to subscribe to the Newsletter icon on this webpage.

Ivan is also able to provide de-identified descriptive data to your school that summarises the wellbeing, emotional and behavioural profile of young people involved in the study from your school.

Quality Assurance

This research has been approved by the Flinders University Social and Behavioural Research Ethics Committee, the Department of Education and Child Development Ethics Committee and Operation Flinders Clinical Advisory Committee. Of importance:

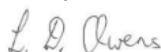
- The details of all participants (teachers and young people) will be kept confidential and anonymity will be maintained throughout the research process.
- Information about the research project and consent forms will be sent to parents/caregivers, teachers and students affiliated with the project.
- In a subsequent phase of the project, a request will be made to a central DECD site to access de-identified electronic data relating to the participants' school attendance, suspension and behaviour/wellbeing. This has been communicated within the Guardian Information Sheets.
- Young people involved in the project will be reimbursed with a \$15.00 voucher (nature of voucher to be negotiated with your school staff) if they consent to participate in the project. However, it has been clearly communicated within all Information Sheets that participation is voluntary and students (and guardians) and teachers may withdraw consent from the project at any time without it affecting their future involvement with the Operation Flinders program.
- There are no foreseeable risks to students or school personnel due to their involvement in the research project.

Should you require additional information regarding this research process, please contact Ivan Raymond on 0417 846 103, or ivan.raymond@flinders.edu.au.

Your consent for this project to be facilitated at your school site is requested by return email.

Thanking you in advance,

Sincerely,



Professor Larry Owens

School of Education

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



Ivan Raymond
School of Education
Faculty of Education, Humanities, Law & Theology

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

INFORMATION SHEET: KEY LOCAL FACILITATOR

PROJECT: OPERATION FLINDERS EVALUATION

Dear Teacher/Counsellor,

This letter provides a detailed overview of a research project in which your support is being requested in one or more of the five steps indicated below.

Brief Overview of Project

Operation Flinders has been providing a service to South Australian high schools and referral agencies for the last 20 years.

Operation Flinders currently receives funding support through the South Australian Attorney General's Department, and to maintain funding, Operation Flinders is required to undergo an independent evaluation in 2013. Operation Flinders was last evaluated in 2001 and 2003 (see <http://www.operationflinders.org.au/about-us/research>). In collaboration with Operation Flinders, I am undertaking the evaluation as part of my PhD with the School of Education, Flinders University. Essentially, I will be comparing young people who attend the program with young people who do not attend the program on a range of social, emotional, forensic, educational and wellbeing outcomes. For additional information on the current evaluation process and context, please go to <http://www.lifebuoyancy.org/operation-flinders-evaluation/>. I am seeking to partner with yourself and/or other key representatives from your school to facilitate the evaluation process.

Requested Partnership Support

The success of the evaluation process is dependent on obtaining a large representative sample of both young people and referral agencies who attend and support Operation Flinders. Therefore, participant engagement remains a distinct challenge for the evaluation. Young people and their families are likely to have higher levels of trust and confidence in key school staff, like yourself, as opposed to external evaluators. Therefore, it has been identified that partnering with key school staff within the evaluation process is the best mechanism to optimise engagement and the project's success. It is acknowledged that you have many things competing for your time and therefore I wish to negotiate with you regarding what support can be offered within this partnership process. All schools and agencies that are referring young people to a 2013 Operation Flinders program are being requested to support the evaluation in the following five ways.

Step	Step Descriptor	Request
1.	Identification of comparison participants	I will be requesting that you (and/or your colleagues) identify 6-7 young people who can be approached to enter the project as <i>comparison participants</i> – these are “young people who would have participated in the program if there were double the number of places available”.
2.	Disseminate and collate Guardian Information Sheets and Consent Forms	I will be requesting that you (and/or your colleagues) disseminate Guardian Information Sheets and Consent Forms to young people attending Operation Flinders (<i>program participants</i>) as well as the <i>comparison participants</i> . I am requesting that your school maintains a register of returned forms and provide reminder cues to students to return forms (within the confines posed by your current work roles and competing work pressures).
3.	Facilitate contact with Key Observers for participants	I will be requesting that you (and/or your colleagues) facilitate my contact with key teachers/counsellors/school staff that could support the evaluation by being key observers within the project. The key observer will be requested to complete a 5 minute questionnaire on participants in the pre- and post-program periods.
4.	Pre-Program Questionnaires	I will be requesting that you (and/or your colleagues) facilitate the completion of a 15-20 minute self-report questionnaire by both the comparison and Operation Flinders participants in the week before the start of your school's involvement in the program. These questionnaires can be returned in a stamped self-addressed envelop. Where possible, I will make myself available to support you administer these questionnaires.
5.	Post-Program Questionnaires	I will be requesting that you (and/or your colleagues) facilitate the completion of a 15-20 minute self-report questionnaire by both the comparison and Operation Flinders participants (six weeks after program completion). Where possible, I will make myself available to support you administer these questionnaires. I will also be providing the key observer questionnaires at this point too. These questionnaires can be returned in a stamped self-addressed envelop. At this point, I will also be requesting the ED-ID numbers of all participants involved in the project.

Importance of Current Evaluation and Broader Wellbeing Research

Operation Flinders report that the proposed "evaluation remains central to meeting our current funding obligations with the South Australian government and further consolidating the long-term sustainability of the Foundation".

At a broader level, the information being collected within the study is tapping a range of constructs that underpin the construct of adolescent life buoyancy. This is a wellbeing construct that is informed by the positive psychology literature, but specifically relates to the insight, skills and mindset possessed by young people that is predictive of adaptive coping and educational engagement in the face of adversity. It includes things such as problem awareness, self-efficacy, positive educational risk-taking, social and emotional skills, and constructive analysis of problems. In addition to supporting the Operation Flinders program, the project will provide significant information on how educational and wellbeing outcomes can be improved for young people at-risk of educational disengagement in South Australia, which has particular relevance given the current South Australian educational and wellbeing strategic direction.

Feedback Available to You and Others

It is understood that schools and youth agencies are extremely busy, and you have many things competing for your time. Therefore, your time and commitment within this process is highly valued. In recognition of this, I have sought to implement ways to help you understand and connect to the project, as well as provide ongoing and timely feedback about the project's findings.

A webpage has been developed to provide a detailed overview of the research project, as well as provide links and resources to a range of topics that relate to adolescent life buoyancy, student wellbeing and wilderness therapy. For more information, please go to www.lifebuoyancy.org.

If you would like to receive regular updates about the progress and findings of the project, you are invited to subscribe to the Newsletter icon on this webpage.

I am also able to provide de-identified descriptive data to your school that summarises the wellbeing, emotional and behavioural profile of young people involved in the study from your school.

Quality Assurance

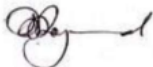
This research has been approved by the Flinders University Social and Behavioural Ethics Committee, the Department of Education and Child Development Ethics Committee and Operation Flinders Clinical Advisory Committee. Of importance:

- Your details will be kept confidential and anonymity will be maintained throughout the research process.
- You will not directly benefit from taking part in this research.
- You are free to withdraw from the project at any time.
- Your participation in this research project is voluntary. If you decide not to participate, this will have no bearing on your relationship with your school or the Operation Flinders program.
- There are no foreseeable risks through your involvement in the research project.

Should you require additional information regarding this research process, please contact myself on 0417 846 103, or ivan.raymond@flinders.edu.au.

Thanking you in advance,

Sincerely,



Ivan Raymond
School of Education

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



Ivan Raymond
School of Education

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

PARENT INFORMATION SHEET

YOUR SUPPORT IS REQUESTED

PROJECT: ADOLESCENT LIFE BUOYANCY

Dear Parent/Caregiver,

Ivan Raymond is a PhD Candidate at Flinders University and is seeking to understand how schools can better support young people remain engaged with and achieve success with school and education.

Purpose of the project

The project is titled: "Adolescent Life Buoyancy" and is being supported by Flinders University's School of Education. Ivan is interested in how young people can remain strong and resilient and achieve their best. If you would like further information about this project, please go to www.lifebuoyancy.org.

What your child will be asked to do?

Your child will be requested to participate by completing a short questionnaire at two points in time approximately 8 weeks apart. The questionnaire asks your child about how they see their problems, their relationships and their strengths.

What benefit will be gained by your child's involvement in this study?

Your child will be reimbursed with a \$15.00 voucher. However, if your child withdraws from the project after providing their written consent they will still receive the voucher.

Will my child be identifiable by being involved in this study?

The details of your child will be kept confidential and anonymity will be maintained throughout the project. Your child's name or identity will not be written or linked to any questionnaire or response provided, or released to your child's school or teachers. In a following phase of the project, Ivan will be making a request to the Department of Education and Child Development to access de-identified electronic data relating to all participants involved in the broader project. This includes school attendance, suspension and behaviour/wellbeing information. Your child's name or identity will not be linked to this data and will only be released in a de-identifiable format.

Are there any risks or discomforts for my child?

Participation in this project is voluntary and you and/or your child may withdraw consent from the project at any time without it affecting your child's involvement with their current school. Your child may answer 'no comment' or refuse to answer any questions at any time.

Follow-up

Understanding the wellbeing and life engagement patterns of young people transitioning into adulthood remains an important area of interest. For this reason, Ivan is considering a follow-up review of all young people involved in the current study in 1-3 years time.

For this to occur, Ivan requests your approval to contact yourself and/or your child in approximately 1-3 years to request both yours and your child's consent for your child to be involved in a potential follow-up review.

If you consent for this contact to occur, you are requested to provide a follow-up phone number and/or address on the consent form. Your details will not be released to a third party or person and will be kept in the strictest confidence. Contact will only occur after any proposed follow-up research has gone through an appropriate ethics committee to ensure that it meets all stringent criteria. Even if you provide your contact details, you or your child may choose to not participate in any follow-up study.

Feedback

If you would like to receive feedback about the findings of the research, you are free to subscribe to an electronic newsletter at www.lifebuoyancy.org.

This research has been approved by the Flinders University Social and Behavioural Research Ethics Committee, the Department of Education and Child Development and Operation Flinders.

If you are happy for your child to take part, a Consent Form is attached for you to sign and return to your child's school. Should you require additional information regarding this research, please contact Ivan Raymond on 0417 846 103, or ivan.raymond@flinders.edu.au

Thank you for considering this request.



Professor Larry Owens

School of Education

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



PARENTAL CONSENT FORM

Adolescent Life Buoyancy

I being over the age of 18 years hereby consent to my child participating, as requested, in the above research project being conducted by:

Principal Researcher: Ivan Raymond, Phone: 0417 846 103, Email: ivan.raymond@flinders.edu.au

I understand that (my child) is being asked to participate in the project by completing a questionnaire at two points in time.

- I have read the information provided. Details of my child's involvement have been explained to my satisfaction.
- I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
- I understand that:
 - My child may not directly benefit from taking part in this research.
 - My child is free to withdraw from the project at any time and is free to decline to answer particular questions.
 - While the information gained in this study will be published, my child will not be identified, and individual information will remain confidential.
 - **My child's participation in this research project is voluntary.**
 - My child will be reimbursed with a \$15.00 voucher. However, if they withdraw from the project after providing their consent they will still receive the voucher.
 - Whether my child participates or not, or withdraws after participating, will have no effect on their relationship with their school or the Operation Flinders program and they are free to withdraw their participation at any time

Signed: _____ Date: _____

Ivan Raymond requests to make contact with me in approximately 1-3 years to request both my and my child's consent for my child to be involved in a follow-up review. I consent for this to occur by providing the following contact details.

My mobile or phone number _____ My child's mobile _____

A contact address where either myself or my child can be contacted in 1-3 years time:

_____ Suburb: _____ Post code: _____

Your contact details will not be released to a third party and will be held in the strictest confidence. You will only be contacted after any proposed follow-up research has gone through an approved ethics committee. Even if you provide your contact details, you may choose to not participate in any follow-up study.



Ivan Raymond
School of Education

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

PARTICIPANT INFORMATION SHEET

PROJECT: ADOLESCENT LIFE BUOYANCY

YOUR TIME AND SUPPORT IS REQUESTED

Ivan Raymond is a PhD student at Flinders University and is seeking to understand how schools can better support young people can remain strong and resilient and achieve their best. You are invited to look at the webpage www.lifebuoyancy.org for more information about the project.

To enable Ivan to complete the project, Ivan is requesting your time to complete some short questionnaires at two points in time which are approximately eight weeks apart from each other.

- The questionnaires will ask about how you see your problems, your relationships with others around you and your strengths. The questionnaire will take approximately 25 minutes of your time.
- Your answers to the questionnaire will remain anonymous or private from your teachers and other young people. At no time will your name or identity be linked to your answers or responses on the written questionnaires.
- In a following phase of the project, Ivan will be making a request to the Department of Education and Child Development to access de-identified electronic data relating to all participants involved in the project. This includes school attendance, suspension and behaviour/wellbeing information. Your name or identity will remain confidential and will not be linked to any of the electronic data provided to Ivan.
- If you consent to participate in the project you will be reimbursed with a \$15.00 voucher. However, your participation in the research project is voluntary and you may withdraw from the project at any time without it affecting any part of your school curriculum. If you withdraw from the project after providing your consent you will still receive the voucher.

If you would like to receive feedback about the findings of the research, you are free to subscribe to an electronic newsletter at www.lifebuoyancy.org.

Should you require additional information regarding this research, please contact Ivan Raymond on 0417 846 103 or ivan.raymond@flinders.edu.au

Thank you for considering this request.

Ivan Raymond

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



CONSENT FORM

PROJECT: ADOLESCENT LIFE BUOYANCY

I (name) _____

Agree to my involvement in the research project entitled: **"Adolescent Life Buoyancy"** being conducted by Ivan Raymond, 0417 846 103, ivan.raymond@flinders.edu.au.

I have read and understood the Information Sheet on the project and understand that I am being asked to participate by completing a short questionnaire at two points in time.

- I understand that I may not directly benefit by taking part in this research.
- I understand that I will not be identified and all individual information will remain confidential.
- I understand that my participation in this research is voluntary.
- I am free to withdraw from the project at any time and or decline to answer particular questions.
- The decision not to participate will in no way affect my grades or relationship with my school.
- I am free to withdraw my participation at any time.
- I will be reimbursed with a \$15.00 voucher. However, if I withdraw from the project after providing my consent I will still receive the voucher.
- I consent to being involved in this project.

Signed: _____ Date: _____



Ivan Raymond
School of Education

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

PARENT INFORMATION SHEET

YOUR SUPPORT IS REQUESTED

PROJECT: UNDERSTANDING OPERATION FLINDERS

Dear Parent/Caregiver,

Ivan Raymond is a PhD Candidate who is working alongside Operation Flinders to assess the effectiveness of the program in order to improve the program for future participants. During your child's involvement in the upcoming Operation Flinders program, your child's involvement in the below research project is being requested.

Purpose of the project

The project is titled: "Understanding Operation Flinders" and is being supported by Flinders University's School of Education. The current research is part of a larger project where Ivan is researching how schools and teachers can better support young people remain strong and resilient and achieve their best. If you would like further information about the broader project, please go to www.lifebuoyancy.org.

What your child will be asked to do?

Your child will be requested to participate by completing a short questionnaire at three points in time: just prior to attending the Operation Flinders program, during the Operation Flinders program and six weeks following the completion of the Operation Flinders program. The questionnaire asks your child about how they see their problems, their relationships and their strengths.

What benefit will be gained by your child's involvement in this study?

Your child will be reimbursed with a \$15.00 voucher. However, if your child withdraws from the project after providing their written consent they will still receive the voucher. An important outcome of the project is that it will support the Operation Flinders Foundation improve the way it delivers its program, thereby improving the outcomes obtained by young people who attend the program into the future.

Will my child be identifiable by being involved in this study?

The details of your child will be kept confidential and anonymity will be maintained throughout the project. Your child's name or identity will not be written or linked to any questionnaire or response provided. In a following phase of the project, Ivan will be making a request to the Department of Education and Child Development to access de-identified electronic data relating to all participants

involved in the broader project. This includes school attendance, suspension and behaviour/wellbeing information. Your child's name or identity will not be linked to this data and will only be released in a de-identified format.

Are there any risks or discomforts for my child?

Participation in this project is voluntary and you and/or your child may withdraw consent from the project at any time without it affecting your child's involvement in the Operation Flinders program or their schooling. Your child may answer 'no comment' or refuse to answer any questions at any time.

Follow-up

Understanding the wellbeing and life engagement patterns of young people transitioning into adulthood remains an important area of interest. For this reason, Ivan is considering a follow-up review of all young people involved in the current study in 1-3 years time.

For this to occur, Ivan requests your approval to contact yourself and/or your child in approximately 1-3 years to request both yours and your child's consent for your child to be involved in a potential follow-up review.

If you consent for this contact to occur, you are requested to provide a follow-up phone number and/or address on the consent form. Your details will not be released to a third party or person and will be kept in the strictest confidence. Contact will only occur after any proposed follow-up research has gone through an appropriate ethics committee to ensure that it meets all stringent criteria. Even if you provide your contact details, you or your child may choose to not participate in any follow-up study.

Feedback

If you would like to receive feedback about the findings of the research, you are free to subscribe to an electronic newsletter at www.lifebuoyancy.org.

This research has been approved by the Flinders University Social and Behavioural Research Ethics Committee, the Department of Education and Child Development and Operation Flinders.

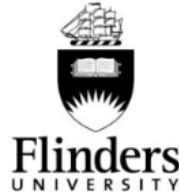
If you are happy for your child to take part, a Consent Form is attached for you to sign and return to your child's school. Should you require additional information regarding this research, please contact Ivan Raymond on 0417 846 103, or ivan.raymond@flinders.edu.au

Thank you for considering this request.



Professor Larry Owens
School of Education

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



PARENTAL CONSENT FORM

Understanding Operation Flinders

I being over the age of 18 years hereby consent to my child..... participating, as requested, in the above research project being conducted by:

Principal Researcher: Ivan Raymond, Phone: 0417 846 103, Email: ivan.raymond@flinders.edu.au

I understand that (my child) is being asked to participate in the project by completing a questionnaire at three points in time.

- I have read the information provided. Details of my child's involvement have been explained to my satisfaction.
- I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
- I understand that:
 - My child may not directly benefit from taking part in this research.
 - My child is free to withdraw from the project at any time and is free to decline to answer particular questions.
 - While the information gained in this study will be published, my child will not be identified, and individual information will remain confidential.
 - My child's participation in this research project is voluntary.
 - My child will be reimbursed with a \$15.00 voucher. However, if my child withdraws from the project after providing their consent they will still receive the voucher.
 - Whether my child participates or not, or withdraws after participating, will have no effect on their relationship with their school or the Operation Flinders program and they are free to withdraw their participation at any time

I consent to my child being involved in this project.

Signed: _____ Date: _____

Ivan Raymond requests to make contact with me in approximately 1-3 years to request both my and my child's consent for my child to be involved in a follow-up review. I consent for this to occur by providing the following contact details.

My mobile or phone number _____ My child's mobile _____

A contact address where either myself or my child can be contacted in 1-3 years time:

_____ Suburb: _____ Post code: _____

Your contact details will not be released to a third party and will be held in the strictest confidence. You will only be contacted after any proposed follow-up research has gone through an approved ethics committee. Even if you provide your contact details, you may choose to not participate in any follow-up study.



Ivan Raymond
School of Education

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

PARTICIPANT INFORMATION SHEET

PROJECT: UNDERSTANDING OPERATION FLINDERS

YOUR TIME AND SUPPORT IS REQUESTED

Ivan Raymond is a PhD student at Flinders University and is working alongside Operation Flinders to evaluate the effectiveness of the program in helping young people. This is part of a larger project where Ivan is working to understand how schools can better support young people remain strong and resilient and achieve their best. You are invited to look at the webpage www.lifebuoyancy.org for more information about the project.

Ivan is requesting your time to complete some short questionnaires at three points in time. This includes just prior to attending the Operation Flinders program, during the Operation Flinders program and six weeks following the completion of the Operation Flinders program.

- The questionnaires will ask about how you see your problems, your relationships with others around you and your strengths. The questionnaire will take approximately 20 minutes of your time.
- Your answers to the questionnaire will remain anonymous or private from your teachers, Operation Flinders staff and other young people. At no time will your name or identity be linked to your answers or responses on the questionnaires.
- In a following phase of the project, Ivan will be making a request to the Department of Education and Child Development to access de-identified electronic data relating to all participants involved in the project. This includes school attendance, suspension and behaviour/wellbeing information. Your name or identity will remain confidential and will not be linked to any of the electronic data provided to Ivan.
- If you consent to participate in the project you will be reimbursed with a \$15.00 voucher. However, your participation in the research project is voluntary and you may withdraw from the project at any time without it affecting your involvement in the Operation Flinders program or any part of your school curriculum. If you withdraw from the project after providing your consent you will still receive the voucher.

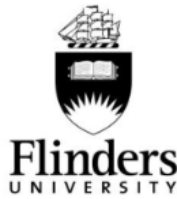
If you would like to receive feedback about the findings of the research, you are free to subscribe to an electronic newsletter at www.lifebuoyancy.org.

Should you require additional information regarding this research, please contact Ivan Raymond on 0417 846 103 or ivan.raymond@flinders.edu.au

Thank you for considering this request.

Ivan Raymond

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



CONSENT FORM

PROJECT: UNDERSTANDING OPERATION FLINDERS

I (name) _____

Agree to my involvement in the research project entitled: **“Understanding Operation Flinders”** being conducted by Ivan Raymond, 0417 846 103, ivan.raymond@flinders.edu.au.

I have read and understood the Information Sheet on the project and understand that I am being asked to participate by completing a short questionnaire at three points in time.

- I understand that I may not directly benefit by taking part in this research.
- I understand that I will not be identified and all individual information will remain confidential.
- I understand that my participation in this research is voluntary.
- I am free to withdraw from the project at any time and or decline to answer particular questions.
- The decision not to participate will in no way affect my grades or relationship with my school or the Operation Flinders program.
- I am free to withdraw my participation at any time.
- I will be reimbursed with a \$15.00 voucher. However, if I withdraw from the project after providing my consent I will still receive the voucher.
- I consent to being involved in this project.

Signed: _____ Date: _____



Ivan Raymond
School of Education
Faculty of Education, Humanities, Law & Theology

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

INFORMATION SHEET: OPERATION FLINDERS TEAM LEADER

PROJECT: ADOLESCENT LIFE BUOYANCY: UNDERSTANDING OPERATION FLINDERS

Dear Operation Flinders Team Leader,

I have been provided your contact details by Operation Flinders management. This letter provides a detailed overview of an evaluation project in which your support is being requested.

Brief Overview of Project

Operation Flinders has been providing a service to South Australian youth-at-risk for the last 20 years. Operation Flinders is committed to better understanding how it can improve its service delivery and program outcomes. In collaboration with Operation Flinders, I am undertaking a PhD with the School of Education, Flinders University. Over the course of 2013 I am evaluating the processes and outcomes of change for young people attending the Operation Flinders program. The research will be an extension of the previous evaluations conducted in 2001 and 2003, but with a stronger educational and wellbeing focus. Essentially I will be comparing young people who attend the program with young people who do not attend the program on a range of social, emotional, forensic and wellbeing outcomes.

Your Requested Support

All team leaders facilitating a 2013 Operation Flinders exercise are requested to support the evaluation process.

Following your consent to participate in the project, I am requesting that you complete a short questionnaire relating to each young person who was a participant on a team in which you facilitated. Each questionnaire will tap a participant's behaviours during the Operation Flinders exercise and take less than 10 minutes to complete. I am requesting that the questionnaire is completed on the final day of the exercise or when you return to basecamp.

Importance of Current Evaluation

Operation Flinders report that the proposed "evaluation remains central to meeting our current funding obligations with the South Australian government and further consolidating the long-term sustainability of the Foundation".

At a broader level, the information being collected within the study will be used by Operation Flinders to find ways to continually improve the way it delivers its program and the way it supports its team staff into the future.

Please note: the current evaluation is not exploring or evaluating team leader performance or outcomes associated with individual teams or schools within the program. Your responses will be pooled and collated with all other team leaders who provide responses in 2013 and your name or individual team identity will not be linked to any responses you provide.

Feedback Available to You and Others

I am acutely aware that following the Operation Flinders exercise you will be very busy, and have many things competing for your time. Therefore, your time and commitment within this process is highly valued. In recognition this, I have sought to implement ways to help you understand and connect to the project, as well as provide ongoing and timely feedback about the project's findings. A web-page has been developed that provides a detailed overview of the research project, as well as information on a range of topics that relate to adolescent life buoyancy (a broader focus of the research). For more information, please go to www.lifebuoyancy.org.

If you would like to receive regular updates about the progress and findings of the project, you are invited to subscribe to the Newsletter icon on this webpage page.

Quality Assurance

This research has been approved by the Flinders University Social and Behavioural Research Ethics Committee, the Department of Education and Child Development Ethics Committee and Operation Flinders Clinical Advisory Committee. Of importance:

- Your details will be kept confidential and anonymity will be maintained throughout the research process (your name or identity will not be linked to your responses)
- You will not directly benefit from taking part in this research.
- You are free to withdraw from the project at any time.
- Your participation in this research project is voluntary. If you decide not to participate, this will have no bearing on your relationship with the Operation Flinders Foundation, Flinders University or myself.
- There are no foreseeable risks through your involvement in the research project.

Should you require additional information regarding this research process, please contact me on 0417 846 103, or ivan.raymond@flinders.edu.au.

Your consent to be involved in this project is requested by completing the attached consent form.

Thanking you in advance,

Sincerely,



Ivan Raymond
PhD Candidate

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



OPERATION FLINDERS TEAM LEADER CONSENT FORM

Adolescent Life Buoyancy: Understanding Operation Flinders

I (name) _____

Agree to my involvement in the research project entitled: **“Adolescent Life Buoyancy: Understanding Operation Flinders”** being conducted by Ivan Raymond, 0417 846 103, ivan.raymond@flinders.edu.au.

I have read and understood the Information Sheet on the project and understand that I am being asked to participate by completing a short questionnaire at the end of the Operation Flinders program I am facilitating.

- I understand that I may not directly benefit by taking part in this research.
- I understand that I will not be identified and all individual information will remain confidential.
- I understand that my participation in this research is voluntary.
- While the information gained in this study will be published, my name or identity will not be identified, and individual information will remain confidential at all times.
- I am free to withdraw from the project at any time.
- The decision not to participate will not impact on my relationship with the Operation Flinders Foundation, Flinders University or Ivan Raymond.
- I consent to being involved in this project.

Signed: _____ Date: _____



Ivan Raymond
School of Education
Faculty of Education, Humanities, Law & Theology

PO Box 3, Aldgate, 5154
Telephone: (+61) 0417 846 103
Email: ivan.raymond@flinders.edu.au

INFORMATION SHEET: KEY OBSERVER

PROJECT: ADOLESCENT LIFE BUOYANCY: UNDERSTANDING OPERATION FLINDERS

Dear Teacher/Counsellor,

I have been provided your contact details by a member of your school who is facilitating young people to attend the upcoming Operation Flinders program. This letter provides a detailed overview of an evaluation project in which your support is being requested.

Brief Overview of Project

Operation Flinders has been providing a service to South Australian high schools for the last 20 years. Operation Flinders is committed to better understanding how it can improve its service delivery and program outcomes. In collaboration with Operation Flinders, I am undertaking a PhD with the School of Education, Flinders University. Over the course of 2013 I am evaluating the processes and outcomes of change for young people attending the Operation Flinders program. The evaluation is a current funding requirement set by the Attorney General's Department. The research will be an extension of the previous evaluations conducted in 2001 and 2003, but with a stronger educational and wellbeing focus. Essentially I will be comparing young people who attend the program with young people who do not attend the program on a range of social, emotional, educational and wellbeing outcomes.

Your Requested Support

All school and youth agencies that nominate teams for a 2013 Operation Flinders exercise are being requested to support the evaluation process. This involves approximately 60 high schools and 150 teachers across both metropolitan and regional South Australia.

Following your consent, I am requesting that you complete a short questionnaire on a student whom is well known to yourself at two points in time, approximately 8 weeks apart. The questionnaire will tap your student's current levels of self-efficacy, awareness of their problems, willingness to take educational risks and social and emotional wellbeing. The questionnaire will take approximately 5 minutes to complete, and can be completed either in a hardcopy or online format. If it is completed as a hardcopy, you are requested to return it in the envelop provided to the teacher/counsellor organising the Operation Flinders program from your school.

Importance of Current Evaluation and Broader Wellbeing Research

Operation Flinders report that the proposed "evaluation remains central to meeting our current funding obligations with the South Australian government and further consolidating the long-term sustainability of the Foundation".

At a broader level, the information being collected within the study is tapping a range of constructs that underpin the construct of adolescent life buoyancy. This is a wellbeing construct that is informed by the positive psychology literature, but specifically relates to the insight, skills and mindset possessed by young people that is predictive of adaptive coping and educational engagement in the face of adversity. It includes things such as problem awareness, self-efficacy, positive educational risk-taking, social and emotional skills, and constructive analysis of problems. In addition to supporting the Operation Flinders program, the project will provide significant information on how educational and wellbeing outcomes can be improved for young

people at-risk of educational disengagement in South Australia, which has particular relevance given the current South Australian educational and wellbeing strategic direction.

Feedback Available to You and Others

I am acutely aware that you are busy, and have many things competing for your time. Therefore, your time and commitment within this process is highly valued. In recognition of this, I have sought to implement ways to help you understand and connect to the project, as well as provide ongoing and timely feedback about the project's findings.

A web-page has been developed to provide a detailed overview of the research project, as well as provide links and resources to a range of topics that relate to adolescent life buoyancy. For more information, please go to www.lifebuoyancy.org.

If you would like to receive regular updates about the progress and findings of the project, you are invited to subscribe to the Newsletter icon on this webpage page.

Quality Assurance

This research has been approved by the Flinders University Social and Behavioural Ethics Committee, the Department of Education and Child Development Ethics Committee and Operation Flinders Clinical Advisory Committee. Of importance:

- Your details will be kept confidential and anonymity will be maintained throughout the research process.
- You will not directly benefit from taking part in this research.
- You are free to withdraw from the project at any time.
- Your participation in this research project is voluntary. If you decide not to participate, this will have no bearing on your relationship with your school or the Operation Flinders program.
- There are no foreseeable risks through your involvement in the research project.

Should you require additional information regarding this research process, please contact myself on 0417 846 103, or ivan.raymond@flinders.edu.au.

Thanking you in advance,

Sincerely,



Ivan Raymond
PhD Candidate

This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project Number 5929). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email human.researchethics@flinders.edu.au.



KEY OBSERVER CONSENT FORM

Adolescent Life Buoyancy: Understanding Operation Flinders

I (name) _____

Agree to my involvement in the research project entitled: **“Adolescent Life Buoyancy: Understanding Operation Flinders”** being conducted by Ivan Raymond, 0417 846 103, ivan.raymond@flinders.edu.au.

I have read and understood the Information Sheet on the project and understand that I am being asked to participate by completing short questionnaires on students known to me at two points in time.

- I understand that I may not directly benefit by taking part in this research.
- I understand that I will not be identified and all individual information will remain confidential.
- I understand that my participation in this research is voluntary.
- While the information gained in this study will be published, my name or identity will not be identified, and individual information will remain confidential at all times.
- I am free to withdraw from the project at any time.
- The decision not to participate will not impact on my relationship with my school or the Operation Flinders program.
- I consent to being involved in this project.

Signed: _____ Date: _____



PARTICIPANT BACKGROUND
(To be completed by Referring Agency)

It is important that the referring agency complete this document accurately to ensure that the participant is provided with the best support during the normal conduct of the Exercise and in case of emergency.

1. PARTICIPANT DETAILS

PARTICIPANT SURNAME.....GIVEN NAME.....
 DOB/...../....., AGE..... SEX.....M F
 ADDRESS.....
 SUBURB..... POSTCODE.....

2. FAMILY/CONTACT DETAILS

Parent/Caregiver Name..... Phone ().....
 Referring Agency..... Phone ().....
 Agency Contact Officer..... Phone ().....
 Single Parent Family YES/NO Indigenous Australian YES/NO Other Cultural Group.....
 Biological Parents Living Separately YES/NO Does the participant currently have stable living arrangements? YES/NO

3. EMERGENCY CONTACT DETAILS

Is the participant a Families SA Client YES/NO Does the person have a Case Worker ? YES/NO
 If Yes Case Worker's Name..... Contact Number ().....
 Is the person under a Court Order? YES/NO
 If Yes please supply relevant details.....
 Are there any transportation restrictions? e.g. does a Families SA Officer need to be in attendance if the participant is sent back to Adelaide mid Exercise? YES/NO
 Other

4. EDUCATION, LEARNING AND COMMUNITY ENGAGEMENT DETAILS

What grade year level is the participant currently undertaking (or last completed if not attending school)?
 How many schools has the young person attended in the last 2 years (please circle) 1 2 3 4-5 6+
 In relation to their current grade year level, please rate the participant's current literacy levels (please circle)
 ABOVE YEAR LEVEL AT YEAR LEVEL 1-2 YEARS BELOW YEAR LEVEL 3+ YEARS BELOW YEAR LEVEL
 Is engagement with school and education an issue for this participant? YES/NO
 Is the participant currently on a Negotiated Education Plan (NEP) at school? YES/NO
 Over the past month, has the participant engaged with a competitive sporting group (football/netball etc)? YES/NO
 Over the past month, has the participant engaged with an organised community group/activity (Scouts/dancing etc)? YES/NO
 Over the past month, has the participant undertaken paid employment? YES/NO

5. PRESENTING BEHAVIOURS SUMMARY

Issues	Yes	No	Details
Does this young person truant regularly from school?			If yes, in the past month, how many times in the past month did the young person truant? _____
Has this young person been suspended from school?			If yes, how many times has the young person been suspended? _____
Has the young person been excluded from a school?			If yes, how many times has the young person been excluded? _____
Has the young person ever been convicted of committing an offence?			If yes, how many times has the young person been convicted? _____
Has the young person ever been diagnosed with a psychological disorder?			If yes, please specify? _____
Has the young person ever been diagnosed with a learning disorder?			If yes, please specify? _____

The following are a number of issues that the participant may be experiencing. Please rate the degree the participant is currently experiencing them from **Not at All** to **Extremely Severe**. Please provide details to issues Operation Flinders should be aware of to ensure that they can provide a safe and individually targeted program.

	Not at all	Extremely severe	Details
Drug, alcohol or substance use	1 2 3 4 5 6 7 8 9 10		
Attention problems	1 2 3 4 5 6 7 8 9 10		
At-risk behaviour	1 2 3 4 5 6 7 8 9 10		
Feeling anxious and/or depressed	1 2 3 4 5 6 7 8 9 10		
Breaking the law	1 2 3 4 5 6 7 8 9 10		
Refusing to follow adult direction	1 2 3 4 5 6 7 8 9 10		
Not attending school, programs or working	1 2 3 4 5 6 7 8 9 10		
Boredom	1 2 3 4 5 6 7 8 9 10		
Managing their anger	1 2 3 4 5 6 7 8 9 10		
Friendship issues	1 2 3 4 5 6 7 8 9 10		
Learning difficulties	1 2 3 4 5 6 7 8 9 10		
Victim of bullying	1 2 3 4 5 6 7 8 9 10		
Hurting themselves	1 2 3 4 5 6 7 8 9 10		
Violence or aggression to adults	1 2 3 4 5 6 7 8 9 10		
Violence or aggression to peers	1 2 3 4 5 6 7 8 9 10		
Social isolation	1 2 3 4 5 6 7 8 9 10		
Bullying peers (verbal/physical/excluding)	1 2 3 4 5 6 7 8 9 10		
Bullying peers (cyber/electronic)	1 2 3 4 5 6 7 8 9 10		
Conflict with caregivers or family	1 2 3 4 5 6 7 8 9 10		
Conflict with teachers or school staff	1 2 3 4 5 6 7 8 9 10		
Identifies with delinquent peers or friends	1 2 3 4 5 6 7 8 9 10		
Uses avoidance coping strategies	1 2 3 4 5 6 7 8 9 10		
Low self-esteem	1 2 3 4 5 6 7 8 9 10		
Impulsivity	1 2 3 4 5 6 7 8 9 10		
Other.....(please specify)	1 2 3 4 5 6 7 8 9 10		

5. FINAL COMMENTS

Please add other aspects not covered above that could help Operation Flinders provide a positive experience for this participant.

Participant code 1

What is your age? _____ Male / Female Year level at school? _____ Date: ___/___/2013

Over the past week, with whom or where have you spent the majority of nights living? **(tick only one)**

One parent
 Both parents
 Other family member (e.g. aunt, uncle)
 Friends
 Couch surfing
 Girlfriend/boyfriend
 Other.....

How many hours sleep did you have last night _____ hours?

Do you identify yourself as Aboriginal or Torres Strait Islander? Yes / No

How much support does your family provide to you? **(tick only one)**

No support at all
 Occasional support
 Regular support
 They are always there for me

When would you like to leave school? **(tick only one)**

As soon as I can
 At the end of year 9
 At the end of year 10
 At the end of year 11
 At the end of year 12
 I have already left school

What would you like to do after you leave school? **(tick only one)**

Go to university
 Go to TAFE
 Get a job
 Go on the dole (Centrelink)
 Start a family
 Something else

Where do you see yourself in 12 months? **(tick only one)**

At school
 Studying at TAFE or University
 Doing an apprenticeship
 Working
 On the dole (Centrelink)
 Something else

Participant code 2

For each of the following questions, please circle the number that best indicates the number of times the event has occurred.

How many times have you been suspended from school?	0	1	2	3	4	5+
How many times have you been excluded from school?	0	1	2	3	4	5+
How many times have you wagged school in the past month?	0	1	2	3	4-9	10+
How many times have you broken the law in the past month?	0	1	2	3	4	5+
How many times have you been convicted of committing an offence?	0	1	2	3	4	5+
On how many separate occasions have you consumed alcohol in the past month?	0	1	2	3	4	5+

These questions are about your opinions. There are no right or wrong answers. Circle the number that best describes how you think about each statement.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
People who have been in trouble with the law think a lot like me	1	2	3	4	5
I have much in common with people who break the law	1	2	3	4	5
I would rather mix with people who obey the law than those who don't	1	2	3	4	5
No one can break the law and then be my friend	1	2	3	4	5
I look up to people who break the law	1	2	3	4	5
On the whole, teachers are honest	1	2	3	4	5
Most teachers care about students	1	2	3	4	5
Life would be better without teachers	1	2	3	4	5
Teachers should be paid more	1	2	3	4	5
Teachers are just in it for themselves	1	2	3	4	5
There should be more teachers in schools	1	2	3	4	5
Teachers don't try to help students	1	2	3	4	5

Participant code 3

Below is a list of behaviours which might occur at school. Please circle the number which best sums up how this behaviour relates to you. Please circle only one number per each line.

Please give your answers on the basis of how things have been for you **over the last two weeks**. There are no right or wrong answers.

	I don't do this behaviour	I do this behaviour, but I don't see it as a problem	This is a problem for me, but I don't want to do anything about fixing it	I am thinking about making changes to fix this problem	I am doing things now to fix this problem
Wagging school	1	2	3	4	5
Skipping classes	1	2	3	4	5
Refusing to attend school	1	2	3	4	5
Anger and aggression at school	1	2	3	4	5
Not following teacher's directions	1	2	3	4	5
Refusing to do work in lessons	1	2	3	4	5
Leaving classes early	1	2	3	4	5
Not doing homework	1	2	3	4	5
Attending school when you have used drugs or alcohol	1	2	3	4	5
Swearing at other students or the teacher	1	2	3	4	5
Giving up when work gets hard	1	2	3	4	5
Bullying other students	1	2	3	4	5
Using Facebook or a mobile phone during lessons	1	2	3	4	5
Coming to school really tired	1	2	3	4	5
Avoiding work in lessons (e.g., taking toilet & drink breaks)	1	2	3	4	5
Zoning out or daydreaming in lessons	1	2	3	4	5
Causing fights between other students	1	2	3	4	5
Not trying new school work if it looks hard	1	2	3	4	5

Participant code

4

For each of the following statements, please circle the number that describes you the best. Read each sentence carefully and answer honestly.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
In most ways my life is close to the way I would want it to be	1	2	3	4	5
The things in my life are excellent	1	2	3	4	5
I am happy with my life	1	2	3	4	5
So far I have gotten the important things I want in life	1	2	3	4	5
If I could live my life over, I would have it the same way	1	2	3	4	5
Things always go wrong for me	1	2	3	4	5
I am a very determined person	1	2	3	4	5
Overall, I expect more good things will happen to me than bad	1	2	3	4	5
I give up easily	1	2	3	4	5
I can see good things happening to me in the future	1	2	3	4	5
I can succeed at almost anything I set my mind to	1	2	3	4	5
When I set important goals for myself, I achieve them	1	2	3	4	5

The following questions are about what you felt or did in the last week. When you think back over the last week, how often have these things happened to you? Please circle the number that best describes your answer.

	Never	Not Often	Sometimes	Often	Very Often
I yelled at someone	1	2	3	4	5
I felt like smashing things	1	2	3	4	5
Other people or things got on my nerves	1	2	3	4	5
I felt like hitting someone	1	2	3	4	5
I abused someone	1	2	3	4	5
I felt like going berserk	1	2	3	4	5
I threatened someone	1	2	3	4	5
I blew my top	1	2	3	4	5

Participant code 5

These questions ask you about the future. Review each item and then circle the number that best indicates how important it is that the event happens to you.

	Not at all		The most important		
You stay out of trouble with the law	1	2	3	4	5
You get a job	1	2	3	4	5
You have a family one day	1	2	3	4	5
You do things for the community	1	2	3	4	5
You are healthy	1	2	3	4	5
Lots of people know who you are	1	2	3	4	5
You have lots of expensive things	1	2	3	4	5
You give to charity	1	2	3	4	5
You are very fit	1	2	3	4	5
You make your own decisions	1	2	3	4	5
You have good friends	1	2	3	4	5
You are very fashionable	1	2	3	4	5
You have lots of money	1	2	3	4	5
You spend time with people you love	1	2	3	4	5
You understand yourself really well	1	2	3	4	5
You have lots of energy	1	2	3	4	5
People say you look good	1	2	3	4	5
You make the world a better place	1	2	3	4	5
You are famous	1	2	3	4	5
You have fun with people	1	2	3	4	5
You like yourself as you are	1	2	3	4	5
You are rich	1	2	3	4	5
You do something that makes you famous	1	2	3	4	5
People say you are attractive	1	2	3	4	5

Participant code 6

These questions are about your opinions. There are no right or wrong answers. Circle the number that best describes how you think about each statement.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
On the whole, police are honest	1	2	3	4	5
A cop is a friend to people in need	1	2	3	4	5
Life would be better without the police	1	2	3	4	5
The police should be paid more	1	2	3	4	5
The police are just as crooked as the people they arrest	1	2	3	4	5
There should be more police	1	2	3	4	5
Police don't try to help people	1	2	3	4	5

The following questions are about how you see yourself. There are no right or wrong answers

For each of the following statements, please circle the number that describes how you see yourself.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Sometimes I think I'm no good at things	1	2	3	4	5
I feel useless at times	1	2	3	4	5
I'm pretty happy with myself	1	2	3	4	5
I can do things as well as most people	1	2	3	4	5
I have a low opinion of myself	1	2	3	4	5

Participant code	1
------------------	---

Thank you very much for completing this questionnaire. We really appreciate your time and support.

Date: ___/___/2013

How much support does your family provide to you? **(tick only one)**

No support at all

Occasional support

Regular support

They are always there for me

When would you like to leave school? **(tick only one)**

As soon as I can

At the end of year 9

At the end of year 10

At the end of year 11

At the end of year 12

I have already left school

What would you like to do after you leave school? **(tick only one)**

Go to university

Go to TAFE

Get a job

Go on the dole (Centrelink)

Start a family

Something else

Don't know

Where do you see yourself in 12 months? **(tick only one)**

At school

Studying at TAFE or University

Doing an apprenticeship

Working

On the dole (Centrelink)

Something else

Don't know

For each of the following questions, please circle the number that best indicates the number of times the event has occurred.

How many times have you wagged school in the past month?	0	1	2	3	4-9	10+
How many times have you broken the law in the past month?	0	1	2	3	4	5+
On how many separate occasions have you consumed alcohol in the past month?	0	1	2	3	4	5+

Participant code 2

These questions are about your opinions. There are no right or wrong answers. Circle the number that best describes how you think about each statement.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
People who have been in trouble with the law think a lot like me	1	2	3	4	5
I have much in common with people who break the law	1	2	3	4	5
I would rather mix with people who obey the law than those who don't	1	2	3	4	5
No one can break the law and then be my friend	1	2	3	4	5
I look up to people who break the law	1	2	3	4	5
On the whole, teachers are honest	1	2	3	4	5
Most teachers care about students	1	2	3	4	5
Life would be better without teachers	1	2	3	4	5
Teachers should be paid more	1	2	3	4	5
Teachers are just in it for themselves	1	2	3	4	5
There should be more teachers in schools	1	2	3	4	5
Teachers don't try to help students	1	2	3	4	5

Below is a list of behaviours which might occur at school. Please circle the number which best sums up how this behaviour relates to you. Please circle only one number per each line.

Please give your answers on the basis of how things have been for you **over the last two weeks**. There are no right or wrong answers.

	I don't do this behaviour	I do this behaviour, but I don't see it as a problem	This is a problem for me, but I don't want to do anything about fixing it	I am thinking about making changes to fix this problem	I am doing things now to fix this problem
Wagging school	1	2	3	4	5
Skipping classes	1	2	3	4	5
Refusing to attend school	1	2	3	4	5
Anger and aggression at school	1	2	3	4	5
Not following teacher's directions	1	2	3	4	5
Refusing to do work in lessons	1	2	3	4	5
Leaving classes early	1	2	3	4	5
Not doing homework	1	2	3	4	5
Attending school when you have used drugs or alcohol	1	2	3	4	5
Swearing at other students or the teacher	1	2	3	4	5
Giving up when work gets hard	1	2	3	4	5
Bullying other students	1	2	3	4	5
Using Facebook or a mobile phone during lessons	1	2	3	4	5
Coming to school really tired	1	2	3	4	5
Avoiding work in lessons (e.g., taking toilet & drink breaks)	1	2	3	4	5
Zoning out or daydreaming in lessons	1	2	3	4	5
Causing fights between other students	1	2	3	4	5
Not trying new school work if it looks hard	1	2	3	4	5

Participant code 4

For each of the following statements, please circle the number that describes you the best. Read each sentence carefully and answer honestly.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
In most ways my life is close to the way I would want it to be	1	2	3	4	5
The things in my life are excellent	1	2	3	4	5
I am happy with my life	1	2	3	4	5
So far I have gotten the important things I want in life	1	2	3	4	5
If I could live my life over, I would have it the same way	1	2	3	4	5
Things always go wrong for me	1	2	3	4	5
I am a very determined person	1	2	3	4	5
Overall, I expect more good things will happen to me than bad	1	2	3	4	5
I give up easily	1	2	3	4	5
I can see good things happening to me in the future	1	2	3	4	5
I can succeed at almost anything I set my mind to	1	2	3	4	5
When I set important goals for myself, I achieve them	1	2	3	4	5

The following questions are about what you felt or did in the last week. When you think back over the last week, how often have these things happened to you? Please circle the number that best describes your answer.

	Never	Not Often	Sometimes	Often	Very Often
I yelled at someone	1	2	3	4	5
I felt like smashing things	1	2	3	4	5
Other people or things got on my nerves	1	2	3	4	5
I felt like hitting someone	1	2	3	4	5
I abused someone	1	2	3	4	5
I felt like going berserk	1	2	3	4	5
I threatened someone	1	2	3	4	5
I blew my top	1	2	3	4	5

Participant code 5

These questions ask you about the future. Review each item and then circle the number that best indicates how important it is that the event happens to you.

	Not at all		The most important		
You stay out of trouble with the law	1	2	3	4	5
You get a job	1	2	3	4	5
You have a family one day	1	2	3	4	5
You do things for the community	1	2	3	4	5
You are healthy	1	2	3	4	5
Lots of people know who you are	1	2	3	4	5
You have lots of expensive things	1	2	3	4	5
You give to charity	1	2	3	4	5
You are very fit	1	2	3	4	5
You make your own decisions	1	2	3	4	5
You have good friends	1	2	3	4	5
You are very fashionable	1	2	3	4	5
You have lots of money	1	2	3	4	5
You spend time with people you love	1	2	3	4	5
You understand yourself really well	1	2	3	4	5
You have lots of energy	1	2	3	4	5
People say you look good	1	2	3	4	5
You make the world a better place	1	2	3	4	5
You are famous	1	2	3	4	5
You have fun with people	1	2	3	4	5
You like yourself as you are	1	2	3	4	5
You are rich	1	2	3	4	5
You do something that makes you famous	1	2	3	4	5
People say you are attractive	1	2	3	4	5

Participant code 6

These questions are about your opinions. There are no right or wrong answers. Circle the number that best describes how you think about each statement.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
On the whole, police are honest	1	2	3	4	5
A cop is a friend to people in need	1	2	3	4	5
Life would be better without the police	1	2	3	4	5
The police should be paid more	1	2	3	4	5
The police are just as crooked as the people they arrest	1	2	3	4	5
There should be more police	1	2	3	4	5
Police don't try to help people	1	2	3	4	5

The following questions are about how you see yourself. There are no right or wrong answers

For each of the following statements, please circle the number that describes how you see yourself.

	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
Sometimes I think I'm no good at things	1	2	3	4	5
I feel useless at times	1	2	3	4	5
I'm pretty happy with myself	1	2	3	4	5
I can do things as well as most people	1	2	3	4	5
I have a low opinion of myself	1	2	3	4	5

Participant Code:

Date of Completion.....

Below is a list of behaviours that might be seen by teachers and schools as a problem for students because they are having a negative impact on the student's: educational performance, school engagement or ability to reach their potential. **Reflecting on the last two weeks**, indicate whether or not you consider the behaviour as representing a problem for this student. If yes is marked, please indicate using your best judgement how the student currently relates to this problem. It would help us if you answered all items, even if you are not absolutely certain.

	From your perspective, does this represent a problem for the student?	If yes, pick one response.			
		This is a problem for the student, but the student does not see it as a problem	The student sees it as a problem, but they are not willing to do anything about fixing it	The student has been talking about making changes to fix this problem	The student has been observed making changes to fix this problem
Wagging school	Yes / No	1	2	3	4
Skipping classes	Yes / No	1	2	3	4
Refusing to attend school	Yes / No	1	2	3	4
Anger and aggression at school	Yes / No	1	2	3	4
Not following teacher's directions	Yes / No	1	2	3	4
Refusing to do work in lessons	Yes / No	1	2	3	4
Leaving classes early	Yes / No	1	2	3	4
Not doing homework	Yes / No	1	2	3	4
Attending school under the influence of alcohol or drugs	Yes / No	1	2	3	4
Swearing at other students or the teacher	Yes / No	1	2	3	4
Giving up when work gets hard	Yes / No	1	2	3	4
Bullying other students	Yes / No	1	2	3	4
Using Facebook or a mobile phone during lessons	Yes / No	1	2	3	4
Coming to school really tired	Yes / No	1	2	3	4
Using work avoidance strategies (e.g., toilet & drink breaks)	Yes / No	1	2	3	4
Zoning out or daydreaming in lessons	Yes / No	1	2	3	4
Setting up conflict between other students in the classroom	Yes / No	1	2	3	4
Not trying new school work if it looks hard	Yes / No	1	2	3	4

On a scale of 1 to 10, how confident are you that you have a good understanding of the issues and problems facing this student at school.

Not confident at all	Marginally confident		Moderately confident		Extremely confident				
1	2	3	4	5	6	7	8	9	10

This scale is designed to provide an estimate of the academic self-esteem of your student. Please base your judgements on the specific behaviours you have observed in the classroom. Please tick the box that corresponds to the best estimate of that behaviour frequency noted in your classroom over the past 2 weeks.

	Never	Seldom	Sometimes	Usually	Always
This young person is willing to undertake new tasks	1	2	3	4	5
This young person is able to make decisions regarding things that affect him or her, e.g., establishing goals, making choices regarding likes and dislikes	1	2	3	4	5
This young person shows self-direction and independence in activities	1	2	3	4	5
This young person initiates new ideas relative to classroom activities or projects	1	2	3	4	5
This young person asks questions when he or she does not understand	1	2	3	4	5
This young person adapts easily to changes in procedures	1	2	3	4	5
This young person is quiet in class, speaks in turn, and talks appropriately	1	2	3	4	5
This young person talks appropriately about his or her school accomplishments	1	2	3	4	5
This young person cooperates with other students	1	2	3	4	5
This young person deals with mistakes or failures easily and comfortably	1	2	3	4	5
This young person takes criticism or corrections in stride without overreacting	1	2	3	4	5
This young person's company is sought by prosocial peers	1	2	3	4	5
This young person acts as a leader in group situations with peers	1	2	3	4	5
The young person refers to himself or herself in generally positive terms	1	2	3	4	5
This young person readily expresses opinions in an appropriate manner	1	2	3	4	5
This young person appreciates his or her work, work products and activities	1	2	3	4	5

This scale is designed to provide an estimate of your student's engagement with education and willingness to undertake educational risks. Please tick the box that corresponds to your assessment of your student's observed presentation over the past 2 weeks.

	Never	Seldom	Sometimes	Usually	Always
This young person is willing to participate in novel (or unfamiliar) numeracy activities	1	2	3	4	5
This young person is willing to participate in novel (or unfamiliar) writing tasks	1	2	3	4	5
This young person is willing to participate in novel (or unfamiliar) reading tasks	1	2	3	4	5
This young person is willing to participate in novel (or unfamiliar) group activities	1	2	3	4	5
This young person is willing to take educational risks or try novel or new school tasks	1	2	3	4	5

Participant Name:

(first name and initial only)

(cut here, this section to be removed)

These statements relate to the Operation Flinders program. There are no right or wrong answers. Please be honest. Think back over the last seven days, and circle the number that best describes how often you had the following experiences.

	Never		Sometimes			Regularly	
I had fun	1	2	3	4	5	6	7
I did things that made me forget life at home	1	2	3	4	5	6	7
I did things which made me feel good	1	2	3	4	5	6	7
I felt excited	1	2	3	4	5	6	7
I laughed	1	2	3	4	5	6	7
There were activities that I wished would never stop	1	2	3	4	5	6	7
I felt uncomfortable in the bush environment	1	2	3	4	5	6	7
I found everything easy	1	2	3	4	5	6	7
I had experiences that challenged me	1	2	3	4	5	6	7
I had to work really hard to complete some activities	1	2	3	4	5	6	7
The program was difficult	1	2	3	4	5	6	7
I enjoyed the feeling of learning new things	1	2	3	4	5	6	7
I felt curious	1	2	3	4	5	6	7
I learnt new things	1	2	3	4	5	6	7
I was interested in understanding what was going to happen next	1	2	3	4	5	6	7
I was bored	1	2	3	4	5	6	7
I enjoyed exploring the natural surroundings	1	2	3	4	5	6	7
I got so involved in an activity that I lost track of time	1	2	3	4	5	6	7
I experienced my imagination	1	2	3	4	5	6	7
I trusted the adults	1	2	3	4	5	6	7
The adults made me feel important	1	2	3	4	5	6	7
The adults understood me	1	2	3	4	5	6	7
The adults took the time to get to know me	1	2	3	4	5	6	7
I had fun with the adults	1	2	3	4	5	6	7
I felt supported by my team members	1	2	3	4	5	6	7
I was bullied by my team members	1	2	3	4	5	6	7
I enjoyed being part of a team	1	2	3	4	5	6	7
My team worked well together	1	2	3	4	5	6	7
Members of my team made me feel uncomfortable	1	2	3	4	5	6	7

The within program youth-report questionnaire was completed by Operation Flinders participants, but the data was not analysed as part of this thesis.

Participant Name:

(first name and initial only)

(cut here, this section to be removed)

	Never		Sometimes			Regularly	
I thought about changing things about myself	1	2	3	4	5	6	7
I thought about problems in my life	1	2	3	4	5	6	7
I avoided conversations with adults when the adult wanted to talk about my problems	1	2	3	4	5	6	7
I thought about the different choices I can make when I return home	1	2	3	4	5	6	7
I was interested in learning about new ways to solve problems	1	2	3	4	5	6	7
I thought about the pros and cons of different future choices	1	2	3	4	5	6	7
I was interested in learning about new ways to think about life	1	2	3	4	5	6	7
I refused to talk about my problems	1	2	3	4	5	6	7
I thought about the areas of my life I need to work on or improve	1	2	3	4	5	6	7
I thought about the adults that could help me in the future	1	2	3	4	5	6	7
I had discussions with adults about future goals	1	2	3	4	5	6	7
I thought about goals I could make for myself for when I return home	1	2	3	4	5	6	7
I thought about what I will need to do to achieve my goals	1	2	3	4	5	6	7
I thought about what adults can help me achieve my goals	1	2	3	4	5	6	7

These statements relate to any goals that you might be considering when you return home. Please circle the number that best indicates how much you agree with each statement.

	Definitely No	Not Sure			Definitely Yes
I have set goals for myself for when I return home	1	2	3	4	5

Only complete the statements below if you have set one or more goals for yourself when you return home.

I know what I need to do to achieve my goals	1	2	3	4	5
I know who I need to speak to in order to achieve my goals	1	2	3	4	5
I am confident that I have the ability to achieve my goals	1	2	3	4	5
I am very confident that I will achieve my goals	1	2	3	4	5

Please rate how willing you would be to attend the Operation Flinders program again?

	Definitely no			Maybe				Definitely yes		
	1	2	3	4	5	6	7	8	9	10

Participant code

This page is to be completed on day 4 and 8 of the program.

Please rate the participant's behaviours on a scale from 1 to 7; with 1 representing non-occurrence of the behaviour and 7 representing a very high frequency of behaviour. Accordingly, 4 would be an average or expected level of occurrence. **Please circle the number that best represents the participant's behaviour from day 1 to 3 of the program.** Then with a cross, please indicate the number that best represents the participant's behaviour from day 5 to 7 of the program. If there is no change, then the cross should be superimposed on the circle.

	Never							Always						
Interactions with peers														
1. Responds without prompting when addressed by another	1	2	3	4	5	6	7	1	2	3	4	5	6	7
2. Is friendly and interested in peers; seeks them out for interactions	1	2	3	4	5	6	7	1	2	3	4	5	6	7
3. Is abrasive or demanding in comments towards and interactions with peers	1	2	3	4	5	6	7	1	2	3	4	5	6	7
4. Is manipulative (friendly for secondary gain) rather than genuine in interactions with peers	1	2	3	4	5	6	7	1	2	3	4	5	6	7
5. Threatens others when does not get own way	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Affect														
6. Depressed: remains withdrawn, minimises interactions with others, low mood, sad	1	2	3	4	5	6	7	1	2	3	4	5	6	7
7. Tense or anxious: responds too quickly, speech pressured, too sharp	1	2	3	4	5	6	7	1	2	3	4	5	6	7
8. Suspicious: lacks trust, wants information repeated, believes only self, does not self-disclose	1	2	3	4	5	6	7	1	2	3	4	5	6	7
9. Happy: smiles easily, laughs appropriately, enjoys the company of others and daily activities	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Self-Esteem														
10. Talks negatively about self and abilities	1	2	3	4	5	6	7	1	2	3	4	5	6	7
11. Criticises accomplishments and performance excessively even when adequate	1	2	3	4	5	6	7	1	2	3	4	5	6	7
12. Displays poor posture, slouches, holds head down, makes poor eye contact	1	2	3	4	5	6	7	1	2	3	4	5	6	7
13. Says positive things about self when asked	1	2	3	4	5	6	7	1	2	3	4	5	6	7
14. Talks openly about self and achievements	1	2	3	4	5	6	7	1	2	3	4	5	6	7
15. Takes pride in personal belongings and appearance	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Conflict														
16. Downgrades others to make self look better	1	2	3	4	5	6	7	1	2	3	4	5	6	7
17. Engages in malicious teasing and horseplay	1	2	3	4	5	6	7	1	2	3	4	5	6	7
18. Argues over minor issues	1	2	3	4	5	6	7	1	2	3	4	5	6	7
19. Becomes abusive when criticised or gives negative feedback	1	2	3	4	5	6	7	1	2	3	4	5	6	7
20. Focuses externally (blames others) when confronted with own issues	1	2	3	4	5	6	7	1	2	3	4	5	6	7

Participant code

This page is to be completed on day 4 and 8 of the program.

	Never						Always
Response Initiation (Spontaneous Behaviour)							
21. Asks others about upcoming activities	1	2	3	4	5	6	7
22. Asks others about wildlife and environment	1	2	3	4	5	6	7
23. Asks others about their feelings, perceptions, experiences	1	2	3	4	5	6	7
24. Volunteers own feelings, thoughts, internal experiences	1	2	3	4	5	6	7
25. Asks others for feedback about self	1	2	3	4	5	6	7
Co-operation							
26. Offers help to peers	1	2	3	4	5	6	7
27. Offers help to staff	1	2	3	4	5	6	7
28. Complies with requests from staff	1	2	3	4	5	6	7
29. Completes assigned tasks without additional prompting	1	2	3	4	5	6	7
Behavioural incidents							
30. Threatens others verbally	1	2	3	4	5	6	7
31. Threatens others physically	1	2	3	4	5	6	7
32. Hits others with hand	1	2	3	4	5	6	7
33. Hits others with weapon	1	2	3	4	5	6	7
34. Endangers self or others inadvertently	1	2	3	4	5	6	7
35. Endangers self or others intentionally	1	2	3	4	5	6	7
36. Attempts to run away	1	2	3	4	5	6	7
37. Hurts self or others intentionally	1	2	3	4	5	6	7
38. Refuses to participate	1	2	3	4	5	6	7

Facilitating the Completion of Questionnaires by Young People – Pre-Program

The following steps are provided to assist in the ethical, reliable and valid completion of questionnaires by young people.

The questionnaires can be completed as a group, or individually. If the questionnaires are completed in a group format, you are requested to ask participants to complete them independently and that no dialogue occurs between participants during the administration. In the administration, can you please follow the proceeding steps and protocol.

- Can you provide participants a copy of the information sheet and consent form related to the study. For participants attending Operation Flinders this is **blue**, and for comparison participants this is **cream**.
- Paraphrase the contents of the information sheet and consent form. If participants have impaired reading/comprehension skills, can you please ensure that young people understand what they are being requested to complete and the volunteer nature of their involvement.
- Following a participant providing their consent, can you provide the participant the corresponding questionnaire:
 - **Blue** – Operation Flinders participant
 - **Cream** – Comparison participant
- You are asked to ensure that the participant's name is filled out on the front tag. Reinforce to the participant that this will be removed by an independent person (replaced with a code) and the participants' responses will remain confidential. Can you also please reinforce to participants that you wish for them to be honest and open with their responses, and that their responses will have no future bearing on their relationship with their teachers, school or Operation Flinders.
- If participants have appropriate reading and comprehension skills, the questionnaire should be completed independently. It is requested that you familiarise participants with the contents and answering of the table on page 3, as this table while initially appearing complex, is relatively straight forward, but may require some familiarisation through your dialogue.
- If you have concerns regarding the reading or comprehension level of the participants, you are requested to read the questionnaire out one item at a time. If a participant has a query with an item you may read it back to them. However, you are asked not to significantly change the interpretation of the item, nor prompt a response.
- **Please note, the most crucial evaluation information is located on pages 1-4. Pages 5 and 6 contain questions that while very valuable, can be skipped if you believe that the answering of these pages will overload a participant, or impact on their willingness or motivation to complete the questionnaire.**
- Can you seal all completed questionnaires in the designated envelop.
- During the administration, can you negotiate with the participants about the nature of the \$15.00 voucher they would like to receive from their local area.
- The questionnaire may be completed in more than one sitting. You will be happy to know that the post-program questionnaire is shorter.
- For this study to benefit both the Operation Flinders Foundation, and ultimately, future young people who undertake the program, you are asked to ensure that all responses are provided in a candid and accurate manner. For this reason, you are asked not to coach or prompt participant responses, or attempt to manipulate any of the data.
- I am aware that a process like this never runs smoothly. If any "hick ups" occur, or, if you have any further questions, I am contactable throughout the research period on 0417 846 103.

Thank you for supporting this process.

Ivan

Facilitating the Completion of Questionnaires by Young People Post-Program

The following steps are provided to assist in the ethical, reliable and valid completion of questionnaires by young people.

The questionnaires can be completed as a group, or individually. If the questionnaires are completed in a group format, you are requested to ask participants to complete them independently and that no dialogue occurs between participants during the administration. In the administration, can you please follow the proceeding steps and protocol.

- Following a participant providing their consent to complete the questionnaire, can you provide the participant the corresponding questionnaire:
 - **Blue** – Operation Flinders participant
 - **Light purple** – Comparison participant

It is requested that the questionnaires are completed in the period 4th to 20th of November, 2013.

- You are asked to hand out the questionnaire as per the name on the tag.
- If participants have appropriate reading and comprehension skills, the questionnaire should be completed independently. It is requested that you familiarise participants with the contents and answering of the table on page 3, as this table while initially appearing complex, is relatively straight forward, but may require some familiarisation through your dialogue.
- If you have concerns regarding the reading or comprehension level of the participants, you are requested to read the questionnaire out one item at a time. If a participant has a query with an item you may read it back to them. However, you are asked not to significantly change the interpretation of the item, nor prompt a response.
- Can you seal all completed questionnaires in the designated envelop. It is requested that the questionnaires are centrally collated and returned in the express post envelop provided and put in the post before the end of the school term.
- Can you please provide the participant a gift voucher of their choice.
- The questionnaire may be completed in more than one sitting.
- For this study to benefit both the Operation Flinders Foundation, and ultimately, future young people who undertake the program, you are asked to ensure that all responses are provided in a candid and accurate manner. For this reason, you are asked not to coach nor prompt participant responses, nor attempt to manipulate any of the data.
- I am aware that a process like this never runs smoothly. If any "hick ups" occur, or, if you have any further questions, I am contactable throughout the research period on 0417 846 103.

Thank you for supporting this process.

Ivan

Facilitating Key Observer Feedback – Pre-Program

The following steps are provided to assist in the ethical, reliable and valid completion of questionnaires by key observers (teachers, counsellors, school staff).

You are requested to identify a key observer who can provide feedback on a young person attending the Operation Flinders program or a comparison participant. Given the confidential and anonymous nature of the study, guardian consent is not required for the completion of the observational measure. Instead, consent is required by the key observers themselves.

- Key observers should be provided an information sheet (white form) and informed consent is provided through either the completion of the questionnaire or the consent form being signed.
- Can you please disseminate the questionnaires in the following manner:
 - **Orange** – Key observer questionnaire to be completed on Operation Flinders participant
 - **Light Purple** – Key observer questionnaire to be completed on Comparison participant
- Key observers are requested to ensure that the **participant's** name is filled out on the front tag. Please note, this will be removed by an independent person (replaced with a code) and the **participant's** responses will remain confidential.
- The key observer is also requested to write their own birthdate (only day of month) on the front tag attached to the questionnaire. This will be used to support the researcher to track the identity (in an anonymous manner) of the key observer across two periods of time. **A participant's date of birth should not be placed here.**
- It is requested that the questionnaires are centrally collated and returned in the envelop provided.
- For this study to benefit both the Operation Flinders Foundation, and ultimately, future young people who undertake the program, key observers are requested to provide responses in a candid and accurate manner.
- I am aware that a process like this never runs smoothly. If any "hick ups" occur, or, if you have any further questions, I am contactable throughout the research period on 0417 846 103.
- Key observers are also free to contact myself by email (ivan.raymond@flinders.edu.au) or 0417 846 103 about their role within this study.

Thank you for supporting this process.

Ivan

Facilitating Key Observer Feedback – Post-Program

The following steps are provided to assist in the ethical, reliable and valid completion of questionnaires by key observers (teachers, counsellors, school staff).

You are requested to forward the allocated questionnaire to the key observer assigned to the participant who completed the questionnaire in the pre-program period of time. While names have been attached by tag to the questionnaire, this will be removed by an independent person (replaced with a code) and the participant's responses will remain confidential.

- The questionnaires are colour coded in the following manner:
 - **Green** – Key observer questionnaire to be completed on Comparison participant
 - **Yellow** – Key observer questionnaire to be completed on Operation Flinders participant

It is requested that the key observer questionnaires are completed in the period 4th to 20th of November, 2013.

- The key observer is also requested to write their own birthdate (only day of month) on the front tag attached to the questionnaire. This will be used to support the researcher to track the identity (in an anonymous manner) of the key observer across two periods of time. **A participant's date of birth should not be placed here.**
- It is requested that the questionnaires are centrally collated and returned in the envelop provided and put in the post before the end of the school term.
- For this study to benefit both the Operation Flinders Foundation, and ultimately, future young people who undertake the program, key observers are requested to provide responses in a candid and accurate manner.
- I am aware that a process like this never runs smoothly. If any "hick ups" occur, or, if you have any further questions, I am contactable throughout the research period on 0417 846 103.
- Key observers are also free to contact myself by email (ivan.raymond@flinders.edu.au) or 0417 846 103 about their role within this study.

Thank you for supporting this process.

Ivan

Appendix V – Ancillary Tables – Pilot Study

Table V.1

Scale Wording, Youth Reported Behaviours (YRB), Teacher Reported Problems (TRP), Youth Reported Problems (YRP) and Correlations (ϕ) between YRP/TRP and YRB/TRP on BCQ (Youth- and Teacher-Report) (Matched Sample, N = 64)

	YRB	YRP	TRP	TRP/ YRB	TRP/ YRP	
Youth-Report	%	%	%	ϕ	ϕ	Teacher-Report
Wagging school	28.2	22.5	28.1	.23	.23	Wagging school
Skipping classes	31.0	21.1	26.2	.25	.23	Skipping classes
Refusing to attend school	28.2	14.1	15.9	.19	.05	Refusing to attend school
Anger and aggression at school	50.7	33.8	50.0	.44	.49	Anger and aggression at school
Not following teacher's directions	60.6	43.7	60.9	.37	.45	Not following teacher's directions
Refusing to do work in lessons	38.0	29.6	49.2	.26	.31	Refusing to do work in lessons
Leaving classes early	31.4	15.7	12.7	.39	.49	Leaving classes early
Not doing homework	67.6	45.1	47.6	.17	.17	Not doing homework
Attending school when you have used drugs or alcohol	20.0	12.9	14.3	.35	.39	Attending school under the influence of alcohol or drugs
Swearing at other students or the teacher	59.2	39.4	43.8	.22	.17	Swearing at other students or the teacher
Giving up when work gets hard	58.6	42.9	50.8	.15	.10	Giving up when work gets hard
Bullying other students	20.0	14.3	25.0	.48	.35	Bullying other students
Using Facebook or a mobile phone during lessons	62.9	35.7	31.3	.41	.17	Using Facebook or a mobile phone during lessons
Coming to school really tired	70.4	42.3	35.9	.27	.31	Coming to school really tired
Zoning out or daydreaming in lessons	57.7	33.8	46.9	.20	.18	Zoning out or daydreaming in lessons
Causing fights between other students	16.9	14.1	29.7	.21	.19	Setting up conflict between other students in the classroom
Not trying new school work if it looks hard	26.8	16.9	47.7	.17	.18	Not trying new school work if it looks hard

Note. Bold correlations are significant at the $p < .01$. Bold and italics are significant at the $p < .05$.

Appendix W – Ancillary Tables – BCQ Validation

Table W.1

Inter-Item YRB Correlations for Behaviour Change Questionnaire (BCQ) Youth–Report

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Wagging school		.62	.49	.29	.35	.33	.42	.21	.31	.33	.25	.22	.26	.24	.30	.16	.35	.34
2 Skipping classes			.40	.36	.41	.39	.53	.23	.34	.33	.27	.26	.30	.27	.35	.19	.39	.36
3 Refusing to attend school				.33	.27	.36	.33	.27	.25	.24	.31	.14	.21	.20	.20	.19	.24	.35
4 Anger and aggression at school					.49	.37	.40	.19	.23	.52	.33	.41	.22	.16	.26	.18	.36	.40
5 Not following teacher's directions						.60	.37	.35	.17	.46	.40	.38	.27	.20	.42	.24	.37	.43
6 Refusing to do work in lessons							.40	.35	.19	.41	.42	.29	.24	.20	.40	.22	.38	.46
7 Leaving classes early								.16	.34	.34	.25	.28	.30	.20	.32	.15	.37	.35
8 Not doing homework									.09	.26	.33	.21	.19	.27	.32	.30	.20	.31
9 Attending school when you have used drugs or alcohol										.16	.14	.23	.18	.07	.18	.08	.31	.24
10 Swearing at other students or the teacher											.35	.37	.28	.27	.38	.20	.40	.44
11 Giving up when work gets hard												.29	.28	.28	.35	.30	.26	.54
12 Bullying other students													.14	.11	.31	.15	.47	.34
13 Using Facebook or a mobile phone during lessons														.36	.30	.24	.19	.24
14 Coming to school really tired															.31	.43	.14	.22
15 Avoiding work in lessons (e.g., taking toilet & drink breaks)																.35	.36	.41
16 Zoning out or daydreaming in lessons																	.17	.24
17 Causing fights between other students																		.47
18 Not trying new school work if it looks hard																		

Note. Bold correlations are significant at the $p < .01$. Bold and italics are significant at the $p < .05$. All items recorded “0”= behaviour is not present and “1”= behaviour is present.

Table W.2

Inter-Item YRP Correlations for Behaviour Change Questionnaire (BCQ) Youth–Report

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Wagging school		.65	.41	.24	.28	.26	.32	.18	.19	.17	.30	.13	.20	.17	.28	.16	.23	.24
2 Skipping classes			.37	.27	.32	.36	.46	.20	.20	.25	.34	.19	.25	.23	.40	.23	.27	.28
3 Refusing to attend school				.24	.28	.36	.35	.25	.18	.20	.32	.11	.06	.16	.24	.19	.24	.27
4 Anger and aggression at school					.52	.34	.38	.15	.20	.48	.29	.36	.15	.16	.25	.20	.36	.31
5 Not following teacher's directions						.60	.42	.27	.14	.41	.41	.32	.24	.15	.32	.19	.34	.37
6 Refusing to do work in lessons							.48	.28	.18	.45	.50	.31	.20	.20	.36	.25	.31	.52
7 Leaving classes early								.23	.30	.36	.32	.24	.23	.20	.34	.19	.34	.39
8 Not doing homework									.15	.23	.36	.21	.27	.31	.38	.32	.18	.29
9 Attending school when you have used drugs or alcohol										.18	.15	.27	.18	.11	.12	.15	.23	.27
10 Swearing at other students or the teacher											.36	.33	.33	.28	.36	.31	.30	.39
11 Giving up when work gets hard												.30	.24	.26	.43	.34	.25	.51
12 Bullying other students													.15	.07	.29	.14	.39	.34
13 Using Facebook or a mobile phone during lessons														.34	.29	.33	.16	.20
14 Coming to school really tired															.35	.49	.15	.24
15 Avoiding work in lessons (e.g., taking toilet & drink breaks)																.44	.26	.41
16 Zoning out or daydreaming in lessons																	.17	.24
17 Causing fights between other students																		.42
18 Not trying new school work if it looks hard																		

Note. Bold correlations are significant at the $p < .01$. Bold and italics are significant at the $p < .05$. All items recorded “O”= behaviour does not represent a problem and “1”= behaviour represents a problem.

Table W.3

Inter-Item TRP Correlations for Behaviour Change Questionnaire (BCQ) Teacher-Report

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Wagging school		.63	.68	.33	.32	.31	.54	.31	.35	.28	.24	.24	.31	.33	.41	.33	.24	.36
2 Skipping classes			.49	.41	.43	.44	.68	.38	.32	.41	.35	.34	.38	.34	.48	.29	.32	.41
3 Refusing to attend school				.39	.28	.29	.47	.25	.37	.31	.23	.32	.25	.38	.36	.30	.34	.31
4 Anger and aggression at school					.54	.52	.42	.30	.26	.67	.39	.56	.32	.26	.41	.22	.49	.44
5 Not following teacher's directions						.70	.44	.47	.21	.55	.47	.46	.37	.18	.49	.29	.40	.45
6 Refusing to do work in lessons							.45	.56	.21	.52	.64	.37	.38	.28	.54	.40	.39	.66
7 Leaving classes early								.33	.33	.43	.31	.42	.46	.36	.52	.34	.41	.38
8 Not doing homework									.16	.32	.54	.32	.39	.37	.41	.39	.21	.41
9 Attending school under the influence of alcohol or drugs										.30	.16	.26	.20	.31	.24	.19	.26	.23
10 Swearing at other students or the teacher											.39	.53	.43	.24	.39	.25	.55	.41
11 Giving up when work gets hard												.30	.27	.37	.42	.45	.27	.73
12 Bullying other students													.41	.19	.37	.13	.67	.27
13 Using Facebook or a mobile phone during lessons														.34	.43	.33	.40	.29
14 Coming to school really tired															.40	.49	.25	.38
15 Using work avoidance strategies (e.g., toilet & drink breaks)																.42	.43	.48
16 Zoning out or daydreaming in lessons																	.20	.52
17 Setting up conflict between other students in the classroom																		.28
18 Not trying new school work if it looks hard																		

Note. Bold correlations are significant at the $p < .01$. Bold and italics are significant at the $p < .05$. All items recorded “O”= behaviour does not represent a problem and “1”= behaviour represents a problem.

Table X.1

Correlations (ϕ) Between Operation Flinders Participant and Referral Agency Static Risk Indices

Truancy History	.47
Suspension History	.57
Exclusion History	.55
Offending History	.32

Note: All correlations are significant at the .001 level (two-tailed).

Table X.2

Comparison of Operation Flinders Participant and Referral Agency Static Risk Indices

	Chi Square	Effect Size (d)
Truancy History	χ^2 (1, N = 286) = 63.90, $p < .001$	0.47
Suspension History	χ^2 (1, N = 280) = 91.72, $p < .001$	0.57
Exclusion History	χ^2 (1, N = 281) = 84.19, $p < .001$	0.55
Offending History	χ^2 (1, N = 270) = 28.18, $p < .001$	0.32

Note: All data were recoded dichotomously as yes or no. Applying Cohen's (1998) conventions of effect size: .10 = small effect, .30 = medium effect and .50 = large effect.

Table X.3

Inter-Item Correlations for Aspirations Index

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1 You do things for the community		.37	<i>.09</i>	.01	.51	.22	.14	.17	.06	-.01	.31	.27	.27	.15	.39	.06	.24	.26	-.04	.07	.01
2 You are healthy			.23	.12	.34	.54	.28	.29	.25	.19	.37	.29	.40	.25	.33	.11	.29	.36	.15	<i>.10</i>	<i>.17</i>
3 Lots of people know who you are				.46	.15	.31	.18	.24	.42	.26	.17	.13	.26	.38	.21	.34	.29	.07	.24	.36	.35
4 You have lots of expensive things					.07	.20	.06	.13	.46	.47	<i>.10</i>	.02	<i>.10</i>	.37	.13	.37	.13	.02	.45	.39	.38
5 You give to charity						.33	.30	.25	.17	.14	.35	.28	.26	.20	.40	.19	.28	.28	<i>.09</i>	.16	.15
6 You are very fit							.33	.23	.36	.34	.34	.26	.52	.39	.35	.23	.27	.25	.30	.16	.30
7 You make your own decisions								.32	.17	.24	.35	.36	.26	.14	.21	.14	.28	.30	<i>.11</i>	.05	.12
8 You have good friends									.28	.19	.48	.38	.31	.28	.27	.13	.46	.39	.14	.18	.21
9 You are very fashionable										.41	.21	.18	.25	.58	.23	.35	.27	.08	.33	.31	.48
10 You have lots of money											.23	.16	.23	.38	.19	.39	.17	.16	.68	.34	.36
11 You spend time with people you love												.44	.38	.21	.32	.10	.40	.44	.17	.11	.15
12 You understand yourself really well													.45	.24	.37	.18	.33	.52	.11	.18	.14
13 You have lots of energy														.35	.35	.13	.33	.35	.23	.15	.23
14 People say you look good															.35	.39	.32	.19	.36	.39	.70
15 You make the world a better place																.32	.37	.41	.26	.32	.32
16 You are famous																	.23	.14	.50	.75	.45
17 You have fun with people																		.42	.17	.27	.27
18 You like yourself as you are																			.15	.19	.16
19 You are rich																				.54	.42
20 You do something that makes you famous																					.48
21 People say you are attractive																					

Note. Bold correlations are significant at the $p < .01$. Bold and italics are significant at the $p < .05$.

Table X.4

Inter-Item Correlations of the Operation Flinders Background Questionnaire

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1 Drug alcohol or substance use		.33	.64	.20	.64	.43	.46	.27	.36	.01	.22	<i>-.11</i>	<i>.12</i>	.36	.30	<i>-.12</i>	.22	.19	.32	.34	.52	.39	<i>.12</i>	.31
2 Attention problems			.57	.26	.35	.57	.35	.46	.53	.29	.52	.18	.16	.42	.47	<i>.11</i>	.43	.36	.39	.56	.41	.53	.34	.48
3 At-risk behaviour				.33	.63	.61	.48	.47	.55	.22	.33	<i>.12</i>	.34	.50	.51	.01	.44	.47	.53	.52	.63	.51	.27	.55
4 Feeling anxious or depressed					.21	.19	.29	.36	.35	.44	.22	.39	.41	.35	.21	.40	.09	.17	.47	.19	.20	.43	.67	.22
5 Breaking the law						.54	.55	.37	.42	.21	.28	.04	.26	.37	.34	.02	.27	.25	.35	.45	.66	.42	.18	.41
6 Refusing to follow adult direction							.40	.41	.59	.24	.38	.14	.22	.66	.54	.02	.54	.44	.49	.79	.57	.62	.24	.54
7 Not attending schools, programs or working								.47	.24	.22	.23	.04	.24	.30	.25	.13	.15	.23	.31	.36	.53	.44	.27	.25
8 Boredom									.31	.20	.28	<i>.09</i>	.25	.28	.23	.09	.24	.31	.35	.40	.44	.47	.34	.31
9 Managing their anger										.36	.38	.28	.26	.62	.67	.09	.52	.38	.45	.59	.36	.45	.28	.52
10 Friendship issues											.24	.52	.23	.29	.33	.54	.36	.44	.37	.31	.25	.31	.46	.23
11 Learning difficulties												.21	<i>.07</i>	.17	.27	.15	.26	.18	.19	.36	.24	.39	.28	.37
12 Victim of bullying													.15	<i>.12</i>	<i>.15</i>	.47	<i>.14</i>	.22	.20	<i>.12</i>	<i>.07</i>	<i>.16</i>	.41	<i>.16</i>
13 Hurting themselves														.27	.19	.20	.16	.20	.39	.16	.21	.30	.30	.21
14 Violence or aggression to adults															.71	.08	.52	.42	.54	.65	.41	.46	.27	.45
15 Violence or aggression to peers																.04	.62	.48	.41	.58	.38	.31	<i>.14</i>	.48
16 Social isolation																	.02	.04	.21	.04	.04	.19	.54	.03
17 Bullying peers (verbal/physical/excluding)																		.75	.40	.61	.41	.38	.08	.45
18 Bullying peers (cyber/electronic)																			.38	.47	.40	.31	<i>.15</i>	.34
19 Conflict with caregivers or family																				.52	.43	.52	.43	.40
20 Conflict with teachers or school staff																					.50	.58	.26	.52
21 Identifies with delinquent peers or friends																						.47	.28	.47
22 Uses avoidance coping strategies																							.53	.52
23 Low self-esteem																								.23
24 Impulsivity																								

Note. Bold correlations are significant at the $p < .01$. Bold and italics are significant at the $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 1)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
1 Age		<i>.10</i>	.02	-.00	.83	-.03	-.19	-.07	-.10	-.07	-.18	.39	.08	-.08	-.22	-.21	-.07	-.06	-.01			
2 Sex (female)			.13	.01	.12	-.08	-.21	-.06	-.03	-.04	.09	.08	.23	.17	.14	.01	.13	.24	-.10			
3 Control participant				.04	.07	.03	.09	.11	.09	-.03	.03	-.09	.10	.20	.15	.06	.15	.14	.16			
4 Indigenous					.01	.14	-.04	-.13	-.02	-.22	-.16	-.12	.00	-.20	-.13	-.21	-.17	-.27	.20			
5 Year level						.03	-.17	-.04	-.03	-.11	-.29	.37	.13	.03	.04	-.08	.06	.12	-.01			
6 Rural (versus city)							.17	.10	.17	-.39	-.25	-.03	-.05	.03	.17	.15	.13	.07	.04			
7 Average sleep								.15	.21	.07	.07	-.09	.05	.10	.01	.05	.06	.17	-.15			
8 Living with both parents									.17	.15	.04	-.04	.03	.17	.19	.26	.15	.12	-.25			
9 Family support										-.05	.08	.02	.11	-.09	-.14	-.05	-.01	.01	.02			
10 Socio-economic status (IRSAD)													.24	-.01	-.02	.05	.09	.13	.03	.07	-.01	
11 Program number														-.16	-.06	.12	-.04	.01	.01	.07	.02	
12 2013 FLO Enrolment															.03	-.04	-.10	-.05	-.16	-.03	.08	
13 Aspire to complete year 12																.22	.34	.23	.30	.33	-.22	
14 NAPLAN Writing																	.51	.49	.41	.53	-.30	
15 NAPLAN Reading																		.66	.79	.62	-.25	
16 NAPLAN Numeracy																			.59	.64	-.40	
17 NAPLAN Language Conventions																				.55	-.30	
18 NAPLAN Spelling																					-.42	
19 OF Back. Question. - Risk & Deviancy																						

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 2)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
20 OF Background Quest. - Interpersonal Problems		.35	-.50	-.29	-.21	.55	-.03	-.31	.48	<i>.14</i>	<i>.15</i>	.18	.24	<i>.15</i>	.22	.11	.48	.23	-.18
21 OF Background Quest. - Social Emotional Problems			-.15	-.29	-.33	.10	-.09	-.18	.15	.09	-.01	-.01	.06	-.03	.01	.07	.14	.12	.01
22 ABC - Interactions with Peers				.62	.47	-.77	.30	.66	-.60	-.15	-.14	-.17	-.21	-.12	-.15	-.09	-.35	-.23	.23
23 ABC - Affect					.68	-.43	.37	.63	-.42	-.07	-.05	-.06	-.11	.01	-.05	-.02	-.17	-.09	.14
24 ABC - Self-Esteem						-.24	.46	.60	-.29	-.03	.01	-.01	.02	.05	.01	-.00	-.07	.00	.05
25 ABC - Conflict							-.10	-.51	.65	.07	.11	.15	.20	.13	.19	.02	.40	.24	-.23
26 ABC - Response Initiation								.49	-.14	-.13	-.05	-.05	-.09	.01	-.04	-.10	-.02	.01	.06
27 ABC - Cooperation									-.39	-.06	-.10	.00	-.15	-.09	-.02	-.03	-.14	-.12	.13
28 ABC - Behavioural Incidents										<i>.12</i>	.08	.13	.20	.09	.15	.03	.29	.18	-.24
29 Truancy frequency											.29	.29	.24	.25	.26	.86	.23	.23	-.20
30 Offending frequency												.35	.32	.83	.28	.27	.22	.35	-.36
31 Alcohol consumption frequency													.28	.37	.79	.31	.28	.25	-.32
32 Pre-program criminal conviction														.34	.26	.19	.27	.23	-.24
33 Pre-program offending															.35	.27	.26	.31	-.29
34 Pre-program alcohol consumption																.28	.27	.23	-.30
35 Pre-program truancy																	.22	.218**	-.18
36 Pre-program suspension																		.28	-.31
37 Identification with Criminal Others																			-.40
38 Attitudes to Police																			

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 3)

	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
39 Attitudes to Teachers		<i>-.28</i>	<i>.17</i>	<i>.29</i>	<i>.33</i>	<i>.11</i>	<i>.35</i>	-.03	<i>.30</i>	<i>.27</i>	<i>.29</i>	<i>.21</i>	<i>.20</i>	<i>.31</i>	<i>.29</i>	<i>-.38</i>	<i>-.21</i>	<i>-.35</i>	<i>-.20</i>
40 Aggressive Impulses			<i>-.42</i>	<i>-.34</i>	<i>-.28</i>	<i>-.39</i>	<i>-.25</i>	.00	<i>-.31</i>	<i>-.24</i>	<i>-.32</i>	<i>-.33</i>	<i>-.24</i>	<i>-.29</i>	<i>-.26</i>	<i>.57</i>	<i>.37</i>	<i>.56</i>	<i>.26</i>
41 Satisfaction with Life				<i>.58</i>	<i>.46</i>	<i>.56</i>	<i>.30</i>	<i>.17</i>	<i>.20</i>	<i>.17</i>	<i>.14</i>	<i>.15</i>	<i>.26</i>	<i>.17</i>	<i>.11</i>	<i>-.35</i>	<i>-.27</i>	<i>-.29</i>	<i>-.27</i>
42 Optimism					<i>.58</i>	<i>.50</i>	<i>.37</i>	<i>.19</i>	<i>.18</i>	<i>.16</i>	<i>.12</i>	<i>.11</i>	<i>.23</i>	<i>.20</i>	.10	<i>-.32</i>	<i>-.18</i>	<i>-.28</i>	<i>-.27</i>
43 Self-Efficacy						<i>.52</i>	<i>.41</i>	<i>.16</i>	<i>.25</i>	<i>.23</i>	<i>.17</i>	<i>.14</i>	<i>.29</i>	<i>.26</i>	<i>.22</i>	<i>-.43</i>	<i>-.27</i>	<i>-.36</i>	<i>-.33</i>
44 Self Esteem							<i>.24</i>	<i>.24</i>	<i>.13</i>	.08	.06	<i>.12</i>	<i>.24</i>	.09	.06	<i>-.28</i>	<i>-.19</i>	<i>-.20</i>	<i>-.30</i>
45 Intrinsic Value Orientation								<i>.41</i>	<i>.18</i>	<i>.18</i>	.07	.08	<i>.23</i>	<i>.15</i>	<i>.18</i>	<i>-.30</i>	<i>-.20</i>	<i>-.32</i>	<i>-.15</i>
46 Extrinsic Value Orientation									<i>-.06</i>	<i>-.04</i>	<i>-.13</i>	<i>-.11</i>	.06	<i>-.09</i>	<i>-.05</i>	.03	.00	.04	<i>-.06</i>
47 Behavior Academic Self-Esteem (BASE)- Total										<i>.94</i>	<i>.85</i>	<i>.81</i>	<i>.79</i>	<i>.88</i>	<i>.86</i>	<i>-.44</i>	<i>-.27</i>	<i>-.46</i>	<i>-.11</i>
48 BASE - Student Initiative											<i>.73</i>	<i>.69</i>	.68	<i>.79</i>	<i>.85</i>	<i>-.39</i>	<i>-.26</i>	<i>-.42</i>	<i>-.08</i>
49 BASE - Social Attention												<i>.74</i>	<i>.50</i>	<i>.74</i>	<i>.75</i>	<i>-.42</i>	<i>-.24</i>	<i>-.48</i>	<i>-.09</i>
50 BASE - Success-Failure													<i>.53</i>	<i>.66</i>	<i>.66</i>	<i>-.37</i>	<i>-.21</i>	<i>-.40</i>	<i>-.07</i>
51 BASE - Social Attention														<i>.69</i>	<i>.60</i>	<i>-.32</i>	<i>-.22</i>	<i>-.26</i>	<i>-.13</i>
52 BASE - Self-Confidence															<i>.75</i>	<i>-.40</i>	<i>-.24</i>	<i>-.41</i>	<i>-.11</i>
53 Educational Risk Taking																<i>-.42</i>	<i>-.27</i>	<i>-.43</i>	<i>-.08</i>
54 BCQ YRB (Total)																	<i>.71</i>	<i>.88</i>	<i>.55</i>
55 BCQ YRB (School Avoidance)																		<i>.51</i>	<i>.28</i>
56 BCQ YRB (Externalising Behaviours)																			<i>.33</i>
57 BCQ YRB (Mental Absence)																			

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 4)

	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
58 BCQ YRP (Total)		.55	.42	.53	.50	.26	.26	.24	.17	.79	.60	.70	.61	.49	.12	.14	-.20	.22
59 BCQ YRB-MTC (Total)			.69	.87	.79	.08	.12	.07	.03	.52	.30	.43	.43	.31	.02	.01	-.02	.03
60 BCQ YRB-MTC (School Avoidance)				.53	.37	-.01	.12	.08	-.12	.42	.76	.20	.21	.25	.08	-.09	.01	-.03
61 BCQ YRB-MTC (Externalising Behaviours)					.53	.10	.11	.06	.10	.50	.27	.41	.43	.28	.00	.03	-.02	.07
62 BCQ YRB-MTC (Mental Absence)						.04	.10	.01	.00	.52	.17	.27	.36	.32	-.05	-.01	.04	-.04
63 BCQ TRP (Total)							.78	.82	.78	.03	-.07	.03	.05	-.72	.34	.25	-.39	.26
64 BCQ TRP (Class and School Avoidance Problems)								.50	.48	.08	.18	.08	.06	-.52	.48	.28	-.52	.18
65 BCQ TRP (Work Avoidance)									.50	.07	-.01	.02	.06	-.57	.24	.17	-.26	.23
66 BCQ TRP (Interpersonal Problems)										-.05	-.15	-.02	.05	-.59	.09	.18	-.17	.28
67 BCQ TRP- MTC (Total)											.68	.81	.67	.56	.07	.05	-.10	.16
68 BCQ TRP-MTC (Class & School Avoidance)												.35	.33	.47	.27	.05	-.23	.18
69 BCQ TRP-MTC (Work Avoidance)													.33	.45	.06	-.01	-.05	.08
70 BCQ TRP-MTC (Interpersonal Problems)														.41	.08	.12	-.14	.28
71 Youth Problem Awareness (YPA)															-.17	-.16	.17	-.04
72 School unexplained absences (2013)																.15	-.76	.12
73 School explained absences (2013)																	-.71	.31
74 School attendance rate (2013)																		-.27
75 Suspension or exclusion in 2013 (DECD data)																		

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 5)

	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
1 Age	-.15	.01	.08	-.02	-.01	-.12	-.08	.12	-.06	.04	.01	.24	-.02	.01	.24	.04	-.05	-.04	-.00
2 Sex (female)	-.14	.17	.13	.04	.02	-.14	.06	.06	-.14	-.04	-.17	-.11	-.17	-.19	-.06	-.01	-.19	-.11	.14
3 Control participant	.08	.11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-.13	-.09	-.08	-.13	-.06	-.01	-.12	-.26	-.12	.19
4 Indigenous	.03	-.08	-.10	-.09	-.05	.03	-.18	-.04	.15	.26	-.02	.02	.07	.03	-.02	.22	.10	.06	-.07
5 Year level	-.13	.00	.07	.00	.02	-.10	-.03	.09	-.08	.08	.01	.26	-.03	.02	.25	.08	-.03	.01	-.02
6 Rural (versus city)	-.03	-.03	-.08	-.05	-.13	.06	.01	-.08	.04	-.01	-.05	-.06	-.04	-.04	-.06	.01	-.10	-.13	.06
7 Average sleep	-.07	-.18	-.00	-.03	-.05	-.02	-.01	-.11	-.01	-.16	-.07	-.11	-.01	-.03	-.10	-.15	-.03	-.15	.15
8 Living with both parents	-.09	-.05	.14	.10	.06	-.17	.02	.12	-.17	-.20	-.15	-.09	-.16	-.12	-.15	-.16	-.23	-.13	.13
9 Family support	.06	-.09	-.04	-.03	-.07	-.03	-.03	-.06	-.07	-.09	-.05	-.16	-.07	-.05	-.15	-.13	-.07	-.18	.21
10 Socio-economic status (IRSAD)	-.00	.02	.16	.18	.15	-.08	.08	.15	-.12	-.18	.02	.03	-.03	.06	.03	-.08	-.01	.07	.03
11 Program number	-.05	.02	.13	.14	.05	-.09	-.03	.11	-.10	-.01	-.01	-.11	-.09	-.02	-.08	.03	-.03	.02	.00
12 2013 FLO Enrolment	.02	.06	-.11	-.15	-.12	.09	-.10	-.19	.11	.01	.13	.27	.15	.10	.16	-.02	.15	.03	-.21
13 Aspire to complete year 12	-.15	-.08	.09	.13	.15	-.09	.13	.06	-.16	-.15	-.20	-.14	-.15	-.21	-.17	-.16	-.24	-.21	.30
14 NAPLAN Writing	-.36	.05	.21	.14	.04	-.17	.07	.14	-.26	-.29	-.24	-.11	-.16	-.28	-.15	-.26	-.33	-.04	.04
15 NAPLAN Reading	-.44	.12	.39	.19	.09	-.14	.07	.23	-.18	-.36	-.16	-.17	-.24	-.26	-.16	-.35	-.36	-.14	.14
16 NAPLAN Numeracy	-.54	.03	.39	.33	.26	-.14	.03	.41	-.19	-.26	-.10	-.10	-.13	-.13	-.07	-.27	-.34	.02	.10
17 NAPLAN Language Conventions	-.36	.05	.34	.21	.14	-.10	.07	.26	-.15	-.34	-.15	-.23	-.18	-.24	-.21	-.35	-.33	-.12	.24
18 NAPLAN Spelling	-.39	-.10	.26	.16	-.01	-.11	-.11	.17	-.08	-.31	-.24	-.14	-.25	-.34	-.18	-.32	-.41	-.23	.23
19 OF Back. Question. - Risk & Deviancy	.62	.31	-.37	-.26	-.21	.37	-.18	-.25	.37	.36	.30	.20	.26	.24	.24	.31	.39	.36	-.29

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 6)

	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
1 Age	.12	-.07	.01	.09	.15	-.02	.05	-.11	.10	.12	.15	.04	.00	.08	.09	-.10	.03	-.17	-.05
2 Sex (female)	.10	-.04	-.12	-.06	-.13	-.37	.05	-.18	.13	.16	.18	.04	-.02	.13	.21	-.13	.02	-.26	.03
3 Control participant	.16	-.11	.11	.07	.09	-.00	.16	.10	.24	.22	.22	.19	.19	.19	.24	-.20	-.12	-.22	-.08
4 Indigenous	.02	.03	.01	.05	.01	.09	.02	.06	-.16	-.18	-.16	-.14	-.04	-.12	-.16	.14	.16	.13	-.04
5 Year level	.07	-.02	.03	.05	.13	-.03	.06	-.10	.11	.12	.14	.04	.03	.09	.08	-.07	.04	-.15	-.02
6 Rural (versus city)	-.05	-.10	.18	.00	.01	.09	.01	.02	.03	.02	-.01	.02	.09	.04	-.07	-.04	-.06	-.04	-.02
7 Average sleep	.08	-.25	.29	.18	.17	.36	.05	.12	.09	.05	.08	.08	.13	.08	.03	-.19	-.21	-.09	-.21
8 Living with both parents	.05	-.11	.22	.07	.12	.14	.16	.04	.23	.23	.19	.20	.15	.20	.22	-.17	-.13	-.16	-.08
9 Family support	.13	-.16	.34	.23	.20	.21	.29	.14	.08	.05	.03	.05	.16	.08	.04	-.18	-.19	-.13	-.16
10 Socio-economic status (IRSAD)	-.04	-.05	-.01	-.02	.02	.09	.02	.02	.01	.00	.03	.06	-.05	.00	.08	.02	.01	.00	.08
11 Program number	.01	-.03	-.01	.01	-.02	.01	-.05	-.04	.03	.03	.07	.08	-.08	.03	.11	.05	.04	.05	-.01
12 2013 FLO Enrolment	.07	.09	.01	.05	.05	-.05	-.01	-.06	-.02	.00	.06	-.03	-.13	-.02	-.03	.01	.06	-.05	.00
13 Aspire to complete year 12	.30	-.12	.11	.13	.22	-.00	.20	-.04	.27	.24	.23	.21	.22	.26	.30	-.31	-.22	-.29	-.06
14 NAPLAN Writing	.16	-.30	.08	-.07	.06	.00	.07	.02	.46	.50	.42	.38	.18	.45	.50	-.29	-.20	-.35	.08
15 NAPLAN Reading	.31	-.31	.09	-.03	.20	-.01	.17	-.07	.46	.46	.49	.35	.25	.37	.50	-.51	-.39	-.50	-.14
16 NAPLAN Numeracy	.16	-.40	.21	.01	.27	.23	.25	-.03	.53	.57	.45	.39	.32	.46	.55	-.42	-.30	-.43	-.15
17 NAPLAN Language Conventions	.17	-.23	.17	-.09	.13	.04	.21	.01	.42	.43	.43	.30	.23	.33	.43	-.36	-.35	-.38	-.05
18 NAPLAN Spelling	.21	-.39	.25	-.02	.18	.08	.21	-.06	.46	.47	.41	.33	.27	.40	.48	-.48	-.37	-.48	-.12
19 OF Back. Question. - Risk & Deviancy	-.06	.31	-.16	-.02	-.10	-.03	-.09	.04	-.40	-.38	-.42	-.29	-.19	-.34	-.39	.38	.38	.32	.03

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 7)

	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
1 Age	-.05	.07	.03	.01	.09	<i>-.11</i>	.05	<i>-.18</i>	<i>-.14</i>	.04	.10	-.07	.08	.06	<i>.10</i>	<i>-.11</i>	-.02	<i>-.19</i>
2 Sex (female)	-.08	.03	.12	.06	-.01	<i>-.11</i>	.03	<i>-.24</i>	<i>-.11</i>	-.03	.01	-.06	-.12	.03	.07	.01	-.04	<i>-.24</i>
3 Control participant	<i>-.11</i>	.02	.12	-.04	.07	<i>-.15</i>	-.08	<i>-.19</i>	<i>-.11</i>	-.07	-.14	-.08	<i>-.16</i>	<i>.10</i>	-.06	-.02	.07	-.07
4 Indigenous	<i>.12</i>	.02	.01	.02	.01	<i>.18</i>	<i>.26</i>	<i>-.24</i>	.01	.09	.11	.09	.07	-.03	<i>.30</i>	.07	<i>-.25</i>	.04
5 Year level	-.07	-.01	.06	-.05	.02	-.07	<i>.11</i>	<i>-.12</i>	<i>-.15</i>	.00	.06	-.10	.05	.03	<i>.16</i>	<i>-.11</i>	-.06	<i>-.20</i>
6 Rural (versus city)	-.01	-.06	.07	-.09	-.02	.05	.02	.09	.02	-.04	-.07	-.01	.06	-.05	-.05	-.06	.08	<i>-.19</i>
7 Average sleep	<i>-.20</i>	<i>-.11</i>	-.09	<i>-.14</i>	<i>-.12</i>	-.07	<i>-.14</i>	.02	-.04	<i>-.12</i>	<i>-.18</i>	-.05	.03	-.06	<i>-.14</i>	<i>-.13</i>	<i>.17</i>	.01
8 Living with both parents	<i>-.15</i>	-.04	-.04	-.02	.00	<i>-.17</i>	<i>-.16</i>	<i>-.15</i>	-.07	<i>-.11</i>	<i>-.21</i>	-.11	-.04	.01	<i>-.22</i>	-.04	<i>.18</i>	-.09
9 Family support	<i>-.10</i>	.03	<i>.19</i>	.05	-.02	-.03	-.08	.06	-.01	-.06	-.05	-.06	-.07	-.05	-.01	-.04	.03	-.06
10 Socio-economic status (IRSAD)	.00	-.01	<i>-.14</i>	.02	-.05	<i>-.16</i>	<i>-.16</i>	<i>-.15</i>	<i>-.11</i>	.00	.06	.05	-.09	<i>.17</i>	<i>-.21</i>	.06	<i>.11</i>	.09
11 Program number	.01	-.02	-.12	.01	.02	<i>-.21</i>	<i>-.18</i>	<i>-.20</i>	<i>-.14</i>	.04	.09	.03	.11	<i>.17</i>	<i>-.10</i>	.06	.05	.01
12 2013 FLO Enrolment	.07	<i>.11</i>	.08	<i>.14</i>	.11	.04	<i>.16</i>	-.07	.00	.08	.02	-.11	<i>.23</i>	-.02	-.09	.02	.02	-.05
13 Aspire to complete year 12	<i>-.18</i>	.07	<i>.15</i>	.04	-.00	<i>-.19</i>	<i>-.12</i>	<i>-.23</i>	-.08	<i>-.13</i>	-.05	<i>-.12</i>	-.12	.05	-.05	<i>-.19</i>	<i>.15</i>	<i>-.21</i>
14 NAPLAN Writing	<i>-.19</i>	-.06	-.09	-.09	.10	<i>-.29</i>	-.06	<i>-.49</i>	-.14	-.20	-.24	-.08	-.25	.15	<i>-.36</i>	-.170	<i>.33</i>	<i>-.27</i>
15 NAPLAN Reading	<i>-.31</i>	.06	.01	.01	.02	<i>-.37</i>	<i>-.24</i>	<i>-.44</i>	<i>-.23</i>	-.19	-.32	-.01	-.25	.16	<i>-.27</i>	<i>-.39</i>	<i>.43</i>	<i>-.33</i>
16 NAPLAN Numeracy	<i>-.22</i>	.13	.03	-.01	.09	<i>-.36</i>	<i>-.26</i>	<i>-.42</i>	-.17	-.17	-.28	.02	-.08	.14	<i>-.25</i>	<i>-.32</i>	<i>.36</i>	<i>-.23</i>
17 NAPLAN Language Conventions	<i>-.27</i>	-.02	.10	-.09	-.09	<i>-.35</i>	<i>-.25</i>	<i>-.41</i>	<i>-.23</i>	<i>-.23</i>	-.31	-.04	-.25	.14	<i>-.20</i>	<i>-.39</i>	<i>.40</i>	<i>-.31</i>
18 NAPLAN Spelling	<i>-.32</i>	.05	.015	-.00	.11	<i>-.30</i>	-.17	<i>-.40</i>	-.14	<i>-.29</i>	<i>-.35</i>	-.19	-.24	.05	<i>-.19</i>	<i>-.31</i>	<i>.33</i>	<i>-.24</i>
19 OF Back. Question. - Risk & Deviancy	<i>.27</i>	.05	-.01	.09	.05	<i>.50</i>	<i>.52</i>	<i>.37</i>	<i>.22</i>	<i>.24</i>	<i>.29</i>	<i>.19</i>	.17	<i>-.20</i>	<i>.42</i>	<i>.32</i>	<i>-.49</i>	<i>.27</i>

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 8)

	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
20 OF Background Quest.- Interpersonal Problems	<i>-.14</i>	.45	<i>-.18</i>	<i>-.13</i>	-.02	-.01	-.04	<i>.14</i>	<i>-.45</i>	<i>-.35</i>	<i>-.56</i>	<i>-.50</i>	<i>-.16</i>	<i>-.33</i>	<i>-.36</i>	.32	.20	.36	.05
21 OF Background Quest. - Social Emotional Problems	-.02	.15	<i>-.25</i>	<i>-.18</i>	-.11	<i>-.26</i>	<i>-.13</i>	-.05	<i>-.16</i>	-.11	-.02	-.11	<i>-.33</i>	-.12	-.06	.08	.11	-.01	.12
22 ABC - Interactions with Peers	<i>.13</i>	<i>-.39</i>	.15	.16	.17	.11	.08	<i>-.13</i>	.39	.33	.39	.36	.21	.36	.37	<i>-.29</i>	<i>-.18</i>	<i>-.32</i>	-.01
23 ABC - Affect	.03	<i>-.19</i>	.15	.11	.18	.09	.17	.01	.35	.35	.22	.23	.34	.30	.32	<i>-.14</i>	-.11	<i>-.15</i>	-.01
24 ABC - Self-Esteem	.01	-.10	.05	.08	.15	.09	.21	.02	.32	.34	.16	.22	.35	.25	.30	-.08	-.03	-.10	-.02
25 ABC - Conflict	<i>-.16</i>	.36	<i>-.18</i>	<i>-.20</i>	<i>-.13</i>	-.10	-.08	.12	<i>-.42</i>	<i>-.35</i>	<i>-.49</i>	<i>-.42</i>	<i>-.20</i>	<i>-.37</i>	<i>-.37</i>	.27	.17	.32	-.06
26 ABC - Response Initiation	-.06	-.01	-.04	-.11	-.04	-.08	.02	-.07	.25	.25	.10	.17	.27	.27	.20	-.04	-.08	-.01	-.02
27 ABC - Cooperation	-.01	<i>-.16</i>	.09	.02	.15	.02	.06	-.09	.37	.36	.29	.29	.27	.32	.32	<i>-.13</i>	-.08	<i>-.15</i>	.00
28 ABC - Behavioural Incidents	-.11	.37	<i>-.20</i>	<i>-.19</i>	<i>-.12</i>	<i>-.12</i>	<i>-.14</i>	.07	<i>-.37</i>	<i>-.29</i>	<i>-.37</i>	<i>-.33</i>	<i>-.27</i>	<i>-.34</i>	<i>-.31</i>	.29	.16	.32	-.03
29 Truancy frequency	<i>-.11</i>	.25	<i>-.13</i>	-.06	<i>-.15</i>	<i>-.10</i>	<i>-.11</i>	.01	<i>-.23</i>	<i>-.24</i>	<i>-.20</i>	<i>-.19</i>	<i>-.17</i>	<i>-.19</i>	<i>-.25</i>	.47	.63	.36	.13
30 Offending frequency	<i>-.11</i>	.29	<i>-.11</i>	-.06	-.06	-.03	-.03	.10	<i>-.14</i>	<i>-.14</i>	<i>-.17</i>	-.08	-.07	<i>-.13</i>	<i>-.17</i>	.30	.25	.25	.08
31 Alcohol consumption frequency	<i>-.14</i>	.29	<i>-.10</i>	<i>-.12</i>	.02	-.06	-.05	.08	<i>-.13</i>	<i>-.11</i>	<i>-.13</i>	<i>-.16</i>	-.06	-.08	<i>-.14</i>	.36	.36	.26	.15
32 Pre-program criminal conviction	-.06	.25	<i>-.16</i>	<i>-.13</i>	<i>-.11</i>	-.07	-.04	.08	<i>-.23</i>	<i>-.24</i>	<i>-.20</i>	<i>-.18</i>	<i>-.13</i>	<i>-.22</i>	<i>-.23</i>	.33	.35	.27	.09
33 Pre-program offending	<i>-.13</i>	.2	-.09	-.04	-.04	-.02	-.00	.13	<i>-.17</i>	<i>-.17</i>	<i>-.21</i>	<i>-.19</i>	-.06	<i>-.14</i>	<i>-.18</i>	.34	.28	.30	.11
34 Pre-program alcohol consumption	<i>-.11</i>	.26	<i>-.16</i>	<i>-.11</i>	-.04	<i>-.09</i>	-.08	.07	<i>-.13</i>	<i>-.12</i>	<i>-.11</i>	<i>-.17</i>	-.06	-.08	<i>-.14</i>	.34	.35	.23	.17
35 Pre-program truancy	<i>-.11</i>	.23	<i>-.14</i>	<i>-.10</i>	<i>-.16</i>	<i>-.13</i>	<i>-.14</i>	-.01	<i>-.26</i>	<i>-.26</i>	<i>-.22</i>	<i>-.20</i>	<i>-.19</i>	<i>-.19</i>	<i>-.28</i>	.47	.63	.35	.16
36 Pre-program suspension	<i>-.22</i>	.36	<i>-.20</i>	<i>-.13</i>	-.08	-.04	<i>-.22</i>	.01	<i>-.36</i>	<i>-.32</i>	<i>-.42</i>	<i>-.35</i>	<i>-.18</i>	<i>-.30</i>	<i>-.35</i>	.43	.31	.44	.12
37 Identification with Criminal Others	<i>-.32</i>	.37	<i>-.30</i>	<i>-.25</i>	<i>-.2</i>	<i>-.14</i>	<i>-.25</i>	-.02	<i>-.16</i>	<i>-.14</i>	<i>-.18</i>	-.08	<i>-.12</i>	<i>-.19</i>	<i>-.16</i>	.45	.38	.38	.20
38 Attitudes to Police	.43	<i>-.33</i>	.21	.23	.20	.07	.33	.03	.24	.22	.23	.19	.15	.23	.24	<i>-.36</i>	<i>-.33</i>	<i>-.30</i>	<i>-.14</i>

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 9)

	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
20 OF Background Quest.- Interpersonal Problems	.15	.02	-.21	.09	-.06	.55	.32	.39	.56	.12	-.09	.07	.21	-.33	.12	.31	-.26	.38
21 OF Background Quest. - Social Emotional Problems	.05	.09	.00	.04	.07	.19	.20	.09	.07	.06	.13	-.07	.07	-.08	.01	.15	-.13	.04
22 ABC - Interactions with Peers	-.20	-.02	-.02	-.07	.01	-.42	-.25	-.33	-.44	-.18	-.04	-.15	-.13	.23	-.15	-.14	.20	-.20
23 ABC - Affect	-.05	.05	-.02	-.08	.14	-.29	-.19	-.28	-.20	-.02	.00	.01	-.07	.25	-.17	-.09	.17	-.16
24 ABC - Self-Esteem	.01	.02	.05	-.04	.08	-.23	-.15	-.24	-.11	.02	.10	-.00	.12	.25	-.01	-.09	.07	-.06
25 ABC - Conflict	.21	.08	.01	.11	.03	.45	.25	.32	.46	.14	.00	.12	.21	-.24	.09	.16	-.15	.21
26 ABC - Response Initiation	-.08	-.08	-.19	-.13	-.06	-.17	-.21	-.17	.01	-.04	-.07	-.08	-.03	.09	-.15	-.08	.19	-.12
27 ABC - Cooperation	-.05	.02	-.02	-.02	.08	-.30	-.18	-.28	-.21	-.06	.05	-.06	-.03	.22	-.05	-.06	.09	-.09
28 ABC - Behavioural Incidents	.16	.03	-.07	.07	-.01	.38	.28	.25	.37	.16	.00	.12	.21	-.21	.11	.20	-.22	.34
29 Truancy frequency	.35	.04	.01	.03	.03	.30	.46	.22	.13	.27	.54	.22	.19	.01	.43	.11	-.38	.14
30 Offending frequency	.29	.07	.10	.11	.03	.14	.14	.08	.12	.15	.21	.18	.17	.07	.06	-.01	-.03	.18
31 Alcohol consumption frequency	.29	-.01	-.05	.03	.03	.19	.20	.07	.19	.17	.09	.15	.21	.06	.13	.10	-.19	.13
32 Pre-program criminal conviction	.27	.06	.00	.10	-.01	.23	.21	.22	.18	.17	.17	.11	.22	.01	.14	.02	-.15	.26
33 Pre-program offending	.32	.07	.05	.11	.06	.18	.15	.13	.16	.15	.20	.15	.19	.07	.06	.02	-.06	.18
34 Pre-program alcohol consumption	.26	-.01	.04	.04	.02	.17	.21	.07	.15	.21	.15	.16	.24	.06	.14	.08	-.17	.08
35 Pre-program truancy	.36	.04	.02	.03	.01	.28	.39	.23	.15	.27	.52	.22	.20	.04	.38	.12	-.34	.15
36 Pre-program suspension	.32	.05	-.03	.15	-.01	.36	.27	.33	.35	.24	.21	.21	.39	-.08	.15	.19	-.23	.35
37 Identification with Criminal Others	.26	-.06	-.13	-.03	-.02	.16	.18	.11	.12	.20	.19	.19	.13	.07	.06	.07	-.11	.25
38 Attitudes to Police	-.20	.10	.07	.09	.08	-.14	-.14	-.11	-.09	-.09	-.12	-.07	-.13	-.00	-.05	-.11	.12	-.17

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 10)

	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
39 Attitudes to Teachers		-.28	.17	.29	.31	.11	.35	-.03	.30	.27	.29	.21	.20	.31	.29	-.38	-.21	-.35	-.20
40 Aggressive Impulses			-.42	-.34	-.28	-.39	-.25	.00	-.31	-.24	-.32	-.33	-.24	-.29	-.26	.57	.37	.56	.26
41 Satisfaction with Life				.58	.46	.56	.30	.17	.20	.17	.14	.15	.26	.17	.11	-.35	-.27	-.29	-.27
42 Optimism					.58	.50	.37	.19	.18	.16	.12	.11	.23	.20	.10	-.32	-.18	-.28	-.27
43 Self-Efficacy						.52	.41	.16	.25	.23	.17	.14	.29	.26	.22	-.43	-.27	-.36	-.33
44 Self-Esteem							.24	.24	.13	.08	.06	.13	.24	.09	.06	-.28	-.19	-.20	-.30
45 Intrinsic Value Orientation								.41	.18	.18	.07	.08	.23	.15	.18	-.30	-.20	-.32	-.15
46 Extrinsic Value Orientation									-.06	-.04	-.13	-.11	.06	-.09	-.05	.03	.00	.04	-.06
47 Behavior Academic Self-Esteem (BASE) - Total										.94	.85	.81	.79	.88	.86	-.44	-.27	-.46	-.11
48 BASE - Student Initiative											.73	.69	.68	.78	.85	-.39	-.26	-.42	-.08
49 BASE - Social Attention												.74	.50	.74	.75	-.42	-.24	-.48	-.09
50 BASE - Success-Failure													.53	.66	.66	-.37	-.21	-.40	-.07
51 BASE - Social Attention														.69	.60	-.32	-.22	-.26	-.13
52 BASE - Self-Confidence															.75	-.40	-.24	-.41	-.11
53 Educational Risk Taking																-.42	-.27	-.43	-.08
54 BCQ YRB (Total)																	.71	.88	.55
55 BCQ YRB (School Avoidance)																		.51	.28
56 BCQ YRB (Externalising Behaviours)																			.33
57 BCQ YRB (Mental Absence)																			

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 11)

	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
39 Attitudes to Teachers	-.14	.24	.18	.19	.17	-.18	-.06	-.21	-.15	-.06	-.15	-.02	.07	.07	-.05	-.10	.11	-.17
40 Aggressive Impulses	.39	-.01	-.14	.06	-.01	.26	.21	.15	.29	.30	.15	.21	.38	.059	.09	.25	-.24	.34
41 Satisfaction with Life	-.23	-.05	-.01	-.10	-.03	-.11	-.09	-.02	-.07	-.20	-.08	-.21	-.15	-.07	-.16	-.17	.22	-.16
42 Optimism	-.21	.02	.13	-.03	.02	-.11	-.07	-.04	-.10	-.21	-.07	-.16	-.22	-.03	.05	-.07	.02	-.17
43 Self-Efficacy	-.26	.07	.03	.03	.06	-.17	-.13	-.13	-.09	-.25	-.15	-.22	-.13	-.04	-.04	-.13	.14	-.17
44 Self-Esteem	-.23	-.06	-.10	-.08	-.07	-.07	-.08	-.00	-.06	-.23	-.15	-.17	-.17	-.08	-.05	-.10	.10	-.07
45 Intrinsic Value Orientation	-.05	.21	.25	.21	.18	-.08	-.08	-.08	-.05	-.05	-.03	-.04	-.05	.05	-.02	-.09	.09	-.18
46 Extrinsic Value Orientation	.06	-.04	-.04	-.01	-.01	.04	.00	.01	.08	-.02	.04	-.01	-.03	.01	-.04	.01	.01	.01
47 Behavior Academic Self-Esteem (BASE) - Total	-.34	-.08	-.12	-.13	.04	-.68	-.44	-.67	-.48	-.21	-.21	-.18	-.20	.37	-.26	-.24	.31	-.33
48 BASE - Student Initiative	-.30	-.07	-.11	-.11	.07	-.62	-.41	-.67	-.37	-.16	-.22	-.15	-.12	.35	-.28	-.20	.29	-.29
49 BASE - Social Attention	-.31	-.04	-.06	-.10	.04	-.66	-.40	-.63	-.57	-.16	-.10	-.18	-.21	.38	-.18	-.21	.23	-.32
50 BASE - Success-Failure	-.30	-.11	-.10	-.20	-.01	-.61	-.39	-.53	-.50	-.22	-.16	-.15	-.31	.33	-.23	-.22	.27	-.30
51 BASE - Social Attention	-.26	-.11	-.11	-.12	-.04	-.46	-.33	-.41	-.27	-.20	-.21	-.13	-.13	.23	-.18	-.20	.24	-.20
52 BASE - Self-Confidence	-.30	-.02	-.12	-.05	.04	-.57	-.34	-.55	-.40	-.18	-.20	-.15	-.16	.29	-.15	-.21	.23	-.29
53 Educational Risk Taking	-.31	-.05	-.12	-.09	.06	-.66	-.44	-.70	-.43	-.16	-.18	-.15	-.16	.38	-.24	-.20	.27	-.31
54 BCQ YRB (Total)	.72	.03	-.11	.04	.04	.35	.33	.31	.24	.63	.53	.55	.50	.23	.19	.25	-.31	.35
55 BCQ YRB (School Avoidance)	.53	.06	.17	.07	.04	.25	.38	.12	.16	.42	.74	.30	.31	.17	.29	.20	-.33	.27
56 BCQ YRB (Externalising Behaviours)	.63	.02	-.18	.05	.00	.38	.29	.37	.31	.55	.36	.52	.56	.15	.12	.25	-.26	.39
57 BCQ YRB (Mental Absence)	.30	-.01	-.09	.01	.13	.06	.03	.07	.00	.44	.21	.28	.22	.21	.10	.11	-.14	.03

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.5

Correlation Matrix of Dependent Measures, Pre-Program Measures, Within Program Measures and Static Risk Indices (Part 12)

	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
58 BCQ YRP (Total)		.55	.42	.53	.50	.29	.26	.24	.17	.79	.60	.70	.61	.49	.12	.14	-.20	.22
59 BCQ YRB-MTC (Total)			.69	.87	.79	.08	.12	.07	.03	.52	.30	.43	.43	.31	.02	.01	-.02	.03
60 BCQ YRB-MTC (School Avoidance)				.53	.37	-.01	.12	.08	-.12	.42	.76	.20	.21	.25	.08	-.09	.01	-.03
61 BCQ YRB-MTC (Externalising Behaviours)					.53	.10	.11	.06	.10	.50	.27	.41	.43	.28	.00	.03	-.02	.07
62 BCQ YRB-MTC (Mental Absence)						.04	.10	.01	.00	.52	.17	.27	.36	.32	-.05	-.01	.04	-.04
63 BCQ TRP (Total)							.78	.82	.78	.03	-.07	.03	.05	-.71	.34	.25	-.39	.26
64 BCQ TRP (Class and School Avoidance Problems)								.50	.48	.08	.18	.08	.06	-.52	.48	.28	-.52	.18
65 BCQ TRP (Work Avoidance)									.50	.07	-.01	.02	.06	-.57	.24	.17	-.26	.23
66 BCQ TRP (Interpersonal Problems)										-.05	-.15	-.02	.05	-.59	.09	.18	-.17	.28
67 BCQ TRP-MTC (Total)											.68	.81	.67	.56	.07	.05	-.10	.16
68 BCQ TRP-MTC (Class & School Avoidance)												.35	.33	.47	.27	.05	-.23	.18
69 BCQ TRP-MTC (Work Avoidance)													.33	.50	.06	-.01	-.05	.08
70 BCQ TRP-MTC (Interpersonal Problems)														.41	.08	.12	-.14	.28
71 Youth Problem Awareness (YPA)															-.17	-.16	.17	-.04
72 School unexplained absences (2013)																.15	-.76	.12
73 School explained absences (2013)																	-.71	.31
74 School attendance rate (2013)																		-.27
75 Suspension or exclusion in 2013 (DECD data)																		

Note: Bold correlations are significant at $p < .01$. Bold and italics correlations are significant at $p < .05$.

Table X.6

Static Risk Indices and Demographic Data for Operation Flinders (N = 414) and Control Group (N = 223) Participants (Entire Sample)

	Operation Flinders		Control Group		Comparative Analysis
	Descriptive	n	Descriptive	n	
Female	30.4%	126	43.0%	96	$\chi^2 (1, N = 637) = 10.16, p < .01$
Aboriginal	19.6%	75	16.4%	33	$\chi^2 (1, N = 584) = .88, p = .35$
Mean Age	15.12	405	15.16	181	$t(584) = -.38, p = .70$
Range of Age	13 to 21	405	12 to 19	181	n/a
Rural	52.7%	218	56.1%	125	$\chi^2 (1, N = 637) = .67, p = .41$
Living With Both Parents	40.6%	131	52.1%	99	$\chi^2 (1, N = 513) = 6.45, p = .01$
>= 1 Suspension	63.2%	215	36.1%	69	$\chi^2 (1, N = 531) = 36.13, p < .001$
>= 1 Exclusion	17.8%	61	11.5%	22	$\chi^2 (1, N = 534) = 3.81, p = .05$
>= 1 Truancy	34.7%	118	23.6%	45	$\chi^2 (1, N = 531) = 7.14, p < .01$
>= 1 Broken Law	23.1%	78	17.7%	34	$\chi^2 (1, N = 529) = 2.17, p = .14$
>= 1 Criminal Conviction	21.5%	69	10.1%	19	$\chi^2 (1, N = 526) = 9.44, p = .002$
>= 1 Consumption of Alcohol	34.3%	114	33.2%	62	$\chi^2 (1, N = 519) = .08, p = .79$

Table X.7

Variables Entered into Imputed Model and Percentage of Missing Data for Each Variable (Part 1)

Variable	Percentage Missing
NAPLAN Numeracy	79.7%
NAPLAN Reading	78.5%
NAPLAN Writing	78.0%
NAPLAN Spelling	76.9%
NAPLAN Language Conventions	76.9%
Educational Risk Taking (Posttest)	37.0%
BASE – Self Confidence (Posttest)	35.1%
BASE – Social Attention (Posttest)	34.6%
BASE – Success-Failure (Posttest)	34.4%
BASE – Social Attraction (Posttest)	34.2%
BASE – Student Initiative (Posttest)	34.2%
BASE – Total (Posttest)	34.2%
BCQ TRP – Homework item (Posttest)	34.0%
BCQ TRP – Skipping item (Posttest)	33.9%
BCQ TRP – Wagging item (Posttest)	33.9%
School explained absences 2014 (DECD)	33.0%
School unexplained absences 2014 (DECD)	33.0%
School attendance rate 2014 (DECD)	33.0%
School suspension/exclusion 2014 (DECD)	32.8%
BCQ TRP – Refusing item (Posttest)	32.8%
BCQ TRP – Giving up item (Posttest)	32.3%
BCQ TRP – Drugs item (Posttest)	32.3%
BCQ TRP – Leaving item (Posttest)	32.3%
BCQ TRP - Avoidance item (Posttest)	32.1%
BCQ TRP – Swearing item (Posttest)	32.1%
BCQ TRP – Refusal item (Posttest)	32.1%
BCQ TRP – Zoning item (Posttest)	31.9%
BCQ TRP – Facebook item (Posttest)	31.9%
BCQ TRP – Directions item (Posttest)	31.9%
BCQ TRP – Tired item (Posttest)	31.7%
BCQ TRP – Bullying item (Posttest)	31.7%
BCQ TRP – Aggression item (Posttest)	31.7%
BCQ TRP – Not trying item (Posttest)	31.6%
BCQ TRP – Conflict item (Posttest)	31.6%
Self-Esteem (Posttest)	29.5%
School suspension/exclusion 2013 (DECD)	26.1%
Attitudes to Police (Posttest)	25.9%
School attendance rate 2013 (DECD)	25.7%
School unexplained absences 2013 (DECD)	25.7%
School explained absences 2013 (DECD)	25.7%
Educational Risk Taking (Pretest)	25.6%
BASE – Success-Failure (Pretest)	25.2%
Optimism (Posttest)	24.9%
BCQ TRP – Homework item (Pretest)	24.9%

Table X.7

Variables Entered into Imputed Model and Percentage of Missing Data for Each Variable (Part 2)

Variable	Percentage Missing
FLO Enrolment 2013	24.7%
BCQ Youth Report – Anger item (Posttest)	24.7%
Intrinsic Value Orientation (Posttest)	24.5%
BASE – Self-Confidence (Pretest)	24.5%
BASE – Social Attraction (Pretest)	24.5%
BCQ Youth Report – Homework item (Pretest)	24.5%
Extrinsic Value Orientation (Posttest)	24.3%
Satisfaction with Life (Posttest)	24.3%
BASE – Social Attention (Pretest)	24.2%
BASE – Student Initiative (Pretest)	24.2%
BASE – Total (Pretest)	24.2%
Self-Efficacy (Posttest)	24.2%
BCQ Youth Report – Swearing item (Posttest)	24.2%
BCQ Youth Report – Facebook item (Posttest)	24.0%
BCQ Youth Report – Refusing item (Posttest)	24.0%
BCQ Youth Report – Avoiding item (Posttest)	23.8%
BCQ Youth Report – Refusal item (Posttest)	23.8%
BCQ Youth Report – Zoning item (Posttest)	23.6%
BCQ Youth Report – Bullying item (Posttest)	23.6%
BCQ Youth Report – Giving up item (Posttest)	23.6%
BCQ Youth Report – Drugs item (Posttest)	23.6%
BCQ Youth Report – Not trying item (Posttest)	23.5%
BCQ Youth Report – Fights item (Posttest)	23.5%
BCQ Youth Report – Leaving item (Posttest)	23.5%
BCQ Youth Report – Not following item (Posttest)	23.5%
BCQ Youth Report – Skipping item (Posttest)	23.5%
BCQ Youth Report – Wagging item (Posttest)	23.5%
Aggressive Impulses (Posttest)	23.3%
BCQ Youth Report – Tired item (Posttest)	23.3%
BCQ Youth Report – Skipping item (Posttest)	23.1%
Attitudes to Teachers (Posttest)	22.8%
Identification with Criminal Others (Posttest)	22.8%
BCQ TRP – Wagging item (Pretest)	22.8%
Alcohol consumption frequency (Posttest)	22.8%
Aspire to complete year 12 (Posttest)	21.5%
BCQ TRP – Facebook item (Pretest)	21.5%
BCQ TRP – Drugs item (Pretest)	21.3%
BCQ TRP – Leaving item (Pretest)	21.3%
BCQ TRP – Refusing item (Pretest)	21.3%
Truancy frequency (Posttest)	21.2%
BCQ TRP – Not trying item (Pretest)	20.8%
BCQ TRP – Zoning item (Pre-program)	20.8%
BCQ TRP – Bullying item (Pretest)	20.8%
BCQ TRP – Directions item (Pretest)	20.8%

Table X.7

Variables Entered into Imputed Model and Percentage of Missing Data for Each Variable (Part 3)

Variable	Percentage Missing
Broken law frequency (Posttest)	20.8%
Family support (Posttest)	20.8%
BCQ TRP - Tired item (Pretest)	20.6%
BCQ TRP – Aggression item (Pretest)	20.6%
BCQ TRP - Conflict item (Pretest)	20.5%
BCQ TRP - Avoidance item (Pretest)	20.5%
BCQ TRP - Swearing item (Pretest)	20.5%
BCQ TRP - Refusal item (Pretest)	20.5%
BCQ TRP – Giving up item (Pretest)	20.3%
Self-Esteem (Pretest)	15.3%
Optimism (Pretest)	13.6%
Sleep hours	13.6%
Satisfaction with Life (Pretest)	13.4%
BCQ Youth Report – Swearing item (Pretest)	13.2%
Self-Efficacy (Pretest)	13.1%
Attitudes to Police (Pretest)	12.9%
Aggressive Impulses (Pretest)	12.7%
BCQ Youth Report – Homework item (Pretest)	12.7%
BCQ Youth Report – Directions item (Pretest)	12.7%
BCQ Youth Report - Anger and aggression at school item (Pretest)	12.7%
BCQ Youth Report - Coming to school really tired item (Pretest)	12.5%
BCQ Youth Report - Refusing to do work in lessons item (Pretest)	12.3%
BCQ Youth Report - Refusing to attend school item (Pretest)	12.3%
Extrinsic Value Orientation (Pretest) (Pretest)	12.2%
BCQ Youth Report - Facebook item (Pretest)	12.2%
BCQ Youth Report - Giving up item (Pretest)	12.2%
BCQ Youth Report - Leaving item (Pretest)	12.2%
Intrinsic Value Orientation (Pretest)	12.0%
Identification with Criminal Others (Pretest)	12.0%
BCQ Youth Report - Avoiding item (Pretest)	12.0%
BCQ Youth Report - Wagging item (Pretest)	12.0%
Attitudes to Teachers (Pretest)	11.8%
BCQ Youth Report - Fights item (Pretest)	11.6%
BCQ Youth Report - Zoning item (Pretest)	11.6%
BCQ Youth Report - Bullying item (Pretest)	11.6%
BCQ Youth Report - Drugs item (Pretest)	11.6%
BCQ Youth Report - Skipping item (Pretest)	11.6%
BCQ Youth Report - Not trying item (Pretest)	11.5%
Alcohol consumption frequency (Pretest)	11.1%
Living with both parents	10.4%
Pre-program criminal conviction	10.4%
Aspire to complete year 12 (Pretest)	10.2%

Table X.7

Variables Entered into Imputed Model and Percentage of Missing Data for Each Variable (Part 4)

Variable	Percentage Missing
Broken law frequency (Pretest)	10.1%
Family support (Pretest)	10.1%
Pre-program exclusion	9.3%
Pre-program suspension	9.2%
Truancy frequency (Pretest)	9.0%
Left school within 12 months of program completion	8.8%
Age	7.9%
Year level	6.2%
Indigenous	5.6%
Rural (versus city)	0%
Sex	0%
Socio-Economic Status (SES, ISRAD)	0%
Operation Flinders participant versus control participant	0%
Program number	0%
Group number	0%

Table Y.1

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Entire Sample PSM With Replacement (Part 1)

	PSM Predictor	Pre-Matching						Post-Matching					
		Operation Flinders (n = 345)		Control Group (n = 209)		Comparative Analysis		Operation Flinders (n = 329)		Control Group (n = 117)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Age	Yes	14.95	1.012	15.01	1.006	0.56	0.05	14.94	1.003	14.90	1.013	-0.34	0.05
Male	Yes	69.0%	n/a	57.4%	n/a	7.66	0.12	68.4%	n/a	62.8%	n/a	1.58	0.05
Indigenous	Yes	18.2%	n/a	16.4%	n/a	0.52	0.02	18.2%	n/a	16.8%	n/a	0.68	0.02
City (versus rural)	Yes	47.3%	n/a	42.5%	n/a	1.18	0.05	46.8%	n/a	50.4%	n/a	0.80	0.03
Year level	Yes	9.64	0.97	9.74	0.93	1.14	0.11	9.63	0.95	9.60	1.01	-0.23	0.03
Living with both parents	Yes	59.2%	n/a	48.4%	n/a	6.27	0.11	58.2%	n/a	61.8%	n/a	0.79	0.03
Family support	Yes	3.38	0.77	3.51	0.74	1.74	0.16	3.39	0.76	3.32	0.81	-0.68	0.09
Pre-program exclusion	Yes	19.5%	n/a	14.4%	n/a	2.38	0.06	18.6%	n/a	16.8%	n/a	0.77	0.02
Pre-program criminal conviction	Yes	22.1%	n/a	12.4%	n/a	8.34	0.12	21.2%	n/a	17.5%	n/a	1.21	0.04
Pre-program suspension	Yes	65.2%	n/a	39.2%	n/a	35.41	0.25	63.9%	n/a	66.7%	n/a	0.89	0.03
Pre-program offending	Yes	28.5%	n/a	24.0%	n/a	1.50	0.05	28.0%	n/a	26.5%	n/a	0.77	0.02
Pre-program alcohol consumption	Yes	39.2%	n/a	39.4%	n/a	0.07	0.00	38.7%	n/a	37.6%	n/a	0.41	0.01
Pre-program truancy	Yes	39.2%	n/a	30.8%	n/a	4.09	0.09	38.6%	n/a	36.8%	n/a	0.82	0.02
School suspension/exclusion 2013 (DECD)	Yes	25.2%	n/a	17.4%	n/a	4.93	0.09	24.7%	n/a	21.7%	n/a	0.86	0.03
Aspire to complete year 12	Yes	69.9%	n/a	77.4%	n/a	3.77	0.08	70.1%	n/a	75.1%	n/a	1.65	0.05
2013 FLO enrolment	Yes	14.5%	n/a	8.0%	n/a	0.98	0.03	13.5%	n/a	12.7%	n/a	0.49	0.01
Socio-economic status (IRSAD)	Yes	934.38	78.60	935.50	61.14	0.18	0.02	934.04	78.78	936.21	65.57	0.24	0.03
School attendance rate 2013	Yes	0.81	0.17	0.83	0.15	1.25	0.13	0.81	0.17	0.83	0.15	0.59	0.09
School unexplained absences 2013	Yes	7.83	10.75	6.40	8.72	-1.44	0.15	7.71	10.62	6.64	9.01	-0.79	0.11
School explained absences 2013	Yes	10.55	10.76	10.56	9.79	0.01	0.00	10.58	10.77	10.49	9.13	-0.06	0.01
Average sleep	Yes	7.59	1.93	7.91	1.83	1.71	0.17	7.63	1.92	7.60	1.96	-0.13	0.02
NAPLAN Reading score	Yes	544.73	31.98	549.78	35.94	1.70	0.15	544.81	32.19	545.12	34.12	0.07	0.01

Table Y.1

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Entire Sample PSM With Replacement (Part 2)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n = 345)		Control Group (n = 209)		Comparative Analysis		Operation Flinders (n = 329)		Control Group (n = 117)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
NAPLAN Numeracy score	Yes	540.73	27.68	542.28	34.06	0.57	0.05	540.69	27.78	539.62	33.16	-0.25	0.04
NAPLAN Writing score	Yes	462.40	61.71	474.21	62.00	2.17	0.19	462.78	61.01	458.48	75.93	-0.46	0.06
NAPLAN Language Conventions score	Yes	515.47	37.21	521.45	47.08	1.62	0.14	515.60	37.55	515.27	45.91	-0.05	0.01
NAPLAN Spelling score	Yes	537.52	33.36	542.26	37.11	1.51	0.13	537.57	33.76	538.55	31.79	0.23	0.03
Wellbeing risk factor	Yes	50.9%	n/a	45.3%	n/a	1.80	0.05	50.8%	n/a	50.5%	n/a	0.38	0.00
Offending risk factor	Yes	38.3%	n/a	29.1%	n/a	4.95	0.09	37.4%	n/a	33.3%	n/a	1.17	0.04
Risk present	Yes	74.5%	n/a	63.9%	n/a	7.05	0.11	74.1%	n/a	77.0%	n/a	0.61	0.03
Program timing	Yes	3.15	1.31	3.13	1.32	0.21	0.00	3.16	1.31	3.23	1.26	0.42	0.05
Identification with Criminal Others - Pretest	Yes	12.47	3.70	11.77	3.32	-2.13	0.20	12.43	3.70	12.42	3.35	-0.04	0.01
Attitudes to Teachers - Pretest	Yes	22.99	4.91	24.21	4.67	2.70	0.25	23.02	4.89	22.66	5.27	-0.57	0.07
Satisfaction with Life - Pretest	Yes	14.75	4.49	15.78	4.87	2.36	0.22	14.78	4.48	14.51	5.12	-0.45	0.06
Optimism - Pretest	Yes	6.73	1.65	6.90	1.71	1.10	0.11	6.72	1.64	6.65	1.90	-0.29	0.04
Self-Efficacy - Pretest	Yes	13.45	2.93	14.02	3.17	1.97	0.19	13.47	2.93	13.18	3.30	-0.75	0.09
Aggressive Impulses - Pretest	Yes	21.40	8.41	19.90	8.16	-1.91	0.18	21.28	8.39	21.40	8.22	0.11	0.01
Attitudes to Police - Pretest	Yes	23.48	6.11	25.42	5.31	3.56	0.34	23.65	6.03	23.65	6.17	0.00	0.00
Self-Esteem - Pretest	Yes	14.52	3.99	14.53	4.30	0.02	0.00	14.53	3.97	14.22	4.24	-0.56	0.07
BASE (Total) - Pretest	Yes	47.83	10.63	52.61	12.17	4.77	0.42	48.03	10.57	48.18	10.43	0.11	0.01
BASE - Student Initiative - Pretest	Yes	17.82	4.50	19.64	5.07	4.29	0.38	17.90	4.49	18.00	4.37	0.17	0.02
BASE - Social Attention - Pretest	Yes	9.34	2.56	10.34	2.68	4.15	0.38	9.39	2.53	9.38	2.58	-0.01	0.00
BASE - Success-Failure - Pretest	Yes	5.86	1.82	6.47	1.97	3.33	0.32	5.88	1.81	5.89	1.86	0.03	0.00
BASE - Social Attraction - Pretest	Yes	8.75	2.43	9.59	2.58	3.67	0.33	8.78	2.42	8.83	2.40	0.13	0.02
BASE - Self-Confidence - Pretest	Yes	6.05	1.64	6.58	1.87	3.23	0.30	6.07	1.63	6.07	1.70	0.01	0.00
Educational Risk Taking - Pretest	Yes	14.72	4.56	16.69	4.60	4.46	0.43	14.82	4.54	15.21	4.11	0.66	0.09
Intrinsic Value Orientation - Pretest	Yes	45.50	7.89	47.84	7.05	3.32	0.31	45.60	7.89	45.24	8.34	-0.31	0.04

Table Y.1

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Entire Sample PSM With Replacement (Part 3)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n = 345)		Control Group (n = 209)		Comparative Analysis		Operation Flinders (n = 329)		Control Group (n = 117)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Extrinsic Value Orientation - Pretest	Yes	26.16	7.50	27.76	7.74	2.27	0.21	26.25	7.48	25.89	7.63	-0.38	0.05
BCQ YRB (Total) - Pretest	Yes	9.46	4.86	7.79	5.19	-3.80	0.33	9.39	4.87	9.26	4.86	-0.20	0.03
BCQ YRP (Total) - Pretest	Yes	5.67	4.53	4.88	4.31	-1.98	0.18	5.65	4.53	5.57	4.44	-0.14	0.02
BCQ YRB-MTC (Total) - Pretest	Yes	2.13	0.82	2.16	0.83	0.28	0.03	2.14	0.83	2.15	0.81	0.05	0.01
BCQ YRB (School Avoidance) - Pretest	Yes	0.82	0.88	0.65	0.86	-2.13	0.19	0.81	0.88	0.78	0.88	-0.24	0.03
BCQ YRP (School Avoidance) - Pretest	Yes	0.45	0.76	0.42	0.72	-0.53	0.05	0.46	0.76	0.48	0.77	0.27	0.04
BCQ YRB-MTC (School Avoidance) - Pretest	Yes	2.03	1.10	2.25	1.10	1.43	0.20	2.06	1.11	2.27	1.13	0.97	0.19
BCQ YRB (Extern. Behaviours) - Pretest	Yes	2.86	1.81	2.16	1.89	-4.20	0.37	2.82	1.81	2.79	1.79	-0.16	0.02
BCQ YRP (Extern. Behaviours) - Pretest	Yes	1.86	1.72	1.40	1.67	-2.95	0.27	1.84	1.73	1.79	1.78	-0.23	0.03
BCQ YRB-MTC (Extern. Behaviours) - Pretest	Yes	2.24	0.97	2.16	0.93	-0.84	0.09	2.24	0.97	2.19	0.95	-0.37	0.06
BCQ YRB (Mental Absence) - Pretest	Yes	1.55	0.70	1.45	0.76	-1.55	0.14	1.55	0.70	1.58	0.67	0.39	0.05
BCQ YRP (Mental Absence) - Pretest	Yes	0.87	0.85	0.91	0.84	0.48	0.05	0.88	0.84	0.86	0.84	-0.16	0.02
BCQ YRB-MTC (Mental Absence) - Pretest	Yes	2.04	1.00	2.17	1.00	1.38	0.14	2.05	1.00	2.01	1.00	-0.25	0.04
BCQ TRP (Total) - Pretest	Yes	8.05	4.70	6.71	5.23	-2.94	0.27	7.98	4.70	7.31	4.81	-1.04	0.14
BCQ TRP-MTC (Total) - Pretest	Yes	1.44	0.86	1.30	0.90	-1.64	0.16	1.44	0.86	1.44	0.86	-0.07	0.01
BCQ TRP (Class & School Avoid.) - Pretest	Yes	1.10	1.18	0.97	1.17	-1.22	0.12	1.09	1.18	0.96	1.13	-0.90	0.12
BCQ TRP-MTC (Class & School Avoid.) - Pretest	Yes	1.19	1.24	1.00	1.26	-1.10	0.15	1.19	1.25	1.19	1.31	0.00	0.00
BCQ TRP (Work Avoidance) - Pretest	Yes	2.50	1.50	2.00	1.58	-3.46	0.32	2.47	1.51	2.28	1.56	-0.84	0.12
BCQ TRP-MTC (Work Avoidance) - Pretest	Yes	1.59	1.10	1.40	1.17	-1.59	0.17	1.59	1.11	1.61	1.14	0.09	0.01
BCQ TRP (Interpersonal Probs.) - Pretest	Yes	1.51	1.48	1.25	1.49	-1.91	0.18	1.50	1.48	1.38	1.52	-0.67	0.08
BCQ TRP-MTC (Interpersonal Probs.) - Pretest	Yes	1.25	1.12	0.99	1.10	-1.81	0.23	1.25	1.13	1.23	1.19	-0.10	0.02
Youth Problem Awareness (YPA) - Pretest	Yes	0.87	0.32	0.90	0.33	1.01	0.09	0.87	0.32	0.90	0.33	0.78	0.10
Truancy frequency - Pretest	Yes	1.14	1.70	0.79	1.39	-2.41	0.23	1.11	1.68	1.03	1.57	-0.39	0.05
Offending frequency - Pretest	Yes	0.77	1.46	0.52	1.13	-2.01	0.19	0.74	1.43	0.66	1.34	-0.44	0.06
Alcohol consumption frequency - Pretest	Yes	0.97	1.51	0.80	1.27	-1.26	0.12	0.94	1.48	0.89	1.44	-0.21	0.03

Table Y.2

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Entire Sample PSM Without Replacement (Part 1)

	PSM Predictor	Pre-Matching						Post-Matching					
		Operation Flinders (n = 345)		Control Group (n = 209)		Comparative Analysis		Operation Flinders (n = 141)		Control Group (n = 141)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Age	Yes	14.95	1.012	15.01	1.006	0.56	0.05	14.93	0.950	14.95	0.988	0.12	0.02
Male	Yes	69.0%	n/a	57.4%	n/a	7.66	0.12	59.3%	n/a	60.0%	n/a	0.61	0.01
Indigenous	Yes	18.2%	n/a	16.4%	n/a	0.52	0.02	16.5%	n/a	16.5%	n/a	0.29	0.00
City (versus rural)	Yes	47.3%	n/a	42.5%	n/a	1.18	0.05	45.0%	n/a	45.1%	n/a	0.21	0.00
Year level	Yes	9.64	0.97	9.74	0.93	1.14	0.11	9.65	0.90	9.67	0.95	0.14	0.02
Living with both parents	Yes	59.2%	n/a	48.4%	n/a	6.27	0.11	53.0%	n/a	52.3%	n/a	0.29	0.01
Family support	Yes	3.38	0.77	3.51	0.74	1.74	0.16	3.43	0.70	3.44	0.76	0.05	0.01
Pre-program exclusion	Yes	19.5%	n/a	14.4%	n/a	2.38	0.06	16.2%	n/a	15.7%	n/a	0.43	0.01
Pre-program criminal conviction	Yes	22.1%	n/a	12.4%	n/a	8.34	0.12	15.4%	n/a	14.9%	n/a	0.41	0.01
Pre-program suspension	Yes	65.2%	n/a	39.2%	n/a	35.41	0.25	49.7%	n/a	49.8%	n/a	0.21	0.00
Pre-program offending	Yes	28.5%	n/a	24.0%	n/a	1.50	0.05	25.1%	n/a	24.5%	n/a	0.21	0.01
Pre-program alcohol consumption	Yes	39.2%	n/a	39.4%	n/a	0.07	0.00	37.3%	n/a	37.7%	n/a	0.19	0.00
Pre-program truancy	Yes	39.2%	n/a	30.8%	n/a	4.09	0.09	33.8%	n/a	33.9%	n/a	0.25	0.00
School suspension/exclusion 2013 (DECD)	Yes	25.2%	n/a	17.4%	n/a	4.93	0.09	19.8%	n/a	19.7%	n/a	0.24	0.00
Aspire to complete year 12	Yes	69.9%	n/a	77.4%	n/a	3.77	0.08	75.0%	n/a	74.6%	n/a	0.38	0.00
2013 FLO enrolment	Yes	14.5%	n/a	8.0%	n/a	0.98	0.03	10.1%	n/a	9.6%	n/a	0.34	0.01
Socio-economic status (IRSAD)	Yes	934.38	78.60	935.50	61.14	0.18	0.02	936.25	79.70	936.01	62.92	-0.02	0.00
School attendance rate 2013	Yes	0.81	0.17	0.83	0.15	1.25	0.13	0.83	0.17	0.83	0.15	0.02	0.00
School unexplained absences 2013	Yes	7.83	10.75	6.40	8.72	-1.44	0.15	6.52	9.35	6.62	8.96	0.08	0.01
School explained absences 2013	Yes	10.55	10.76	10.56	9.79	0.01	0.00	10.74	11.88	10.65	9.58	-0.06	0.01
Average sleep	Yes	7.59	1.93	7.91	1.83	1.71	0.17	7.79	1.90	7.78	1.85	-0.05	0.01
NAPLAN Reading	Yes	544.73	31.98	549.78	35.94	1.70	0.15	547.28	31.87	546.91	34.59	-0.08	0.01

Table Y.2

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Entire Sample PSM Without Replacement (Part 2)

	PSM Predictor	Pre-Matching						Post-Matching					
		Operation Flinders (n = 345)		Control Group (n = 209)		Comparative Analysis		Operation Flinders (n = 141)		Control Group (n = 141)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
NAPLAN Numeracy	Yes	540.73	27.68	542.28	34.06	0.57	0.01	541.08	30.52	541.36	31.25	0.07	0.01
NAPLAN Writing	Yes	462.40	61.71	474.21	62.00	2.17	0.01	468.56	53.21	468.98	61.12	0.06	0.01
NAPLAN Language Conventions	Yes	515.47	37.21	521.45	47.08	1.62	0.04	518.96	36.20	518.42	46.87	-0.10	0.01
NAPLAN Spelling	Yes	537.52	33.36	542.26	37.11	1.51	0.05	540.33	33.17	540.10	33.68	-0.05	0.01
Wellbeing risk factor	Yes	50.9%	n/a	45.3%	n/a	1.80	0.05	49.3%	n/a	49.3%	n/a	0.30	0.00
Offending risk factor	Yes	38.3%	n/a	29.1%	n/a	4.95	0.09	31.4%	n/a	30.9%	n/a	0.28	0.01
Risk present	Yes	74.5%	n/a	63.9%	n/a	7.05	0.11	70.3%	n/a	69.7%	n/a	0.19	0.01
Program timing	Yes	3.15	1.31	3.13	1.32	0.21	0.00	3.16	1.34	3.15	1.29	-0.07	0.00
Identification with Criminal Others - Pretest	Yes	12.47	3.70	11.77	3.32	-2.13	0.13	11.96	3.61	11.98	3.35	0.03	0.00
Attitudes to Teachers - Pretest	Yes	22.99	4.91	24.21	4.67	2.70	0.19	23.61	4.76	23.66	4.73	0.09	0.01
Satisfaction with Life - Pretest	Yes	14.75	4.49	15.78	4.87	2.36	0.17	15.15	4.36	15.17	4.90	0.04	0.01
Optimism - Pretest	Yes	6.73	1.65	6.90	1.71	1.10	0.10	6.81	1.60	6.79	1.75	-0.08	0.01
Self-Efficacy - Pretest	Yes	13.45	2.93	14.02	3.17	1.97	0.19	13.66	2.97	13.73	3.10	0.17	0.02
Aggressive Impulses - Pretest	Yes	21.40	8.41	19.90	8.16	-1.91	0.15	20.49	8.04	20.43	8.08	-0.05	0.01
Attitudes to Police - Pretest	Yes	23.48	6.11	25.42	5.31	3.56	0.23	24.87	5.68	24.79	5.41	-0.11	0.01
Self-Esteem - Pretest	Yes	14.52	3.99	14.53	4.30	0.02	0.00	14.42	4.07	14.42	4.20	0.00	0.00
BASE (Total) - Pretest	Yes	47.83	10.63	52.61	12.17	4.77	0.08	50.46	10.47	50.47	11.23	0.01	0.00
BASE - Student Initiative - Pretest	Yes	17.82	4.50	19.64	5.07	4.29	0.13	18.89	4.45	18.87	4.63	-0.04	0.01
BASE - Social Attention - Pretest	Yes	9.34	2.56	10.34	2.68	4.15	0.23	9.88	2.51	9.91	2.62	0.08	0.01
BASE - Success-Failure - Pretest	Yes	5.86	1.82	6.47	1.97	3.33	0.33	6.19	1.70	6.18	1.91	-0.04	0.01
BASE - Social Attraction - Pretest	Yes	8.75	2.43	9.59	2.58	3.67	0.18	9.17	2.46	9.18	2.49	0.03	0.00
BASE - Self-Confidence - Pretest	Yes	6.05	1.64	6.58	1.87	3.23	0.28	6.33	1.62	6.33	1.77	0.02	0.00
Educational Risk Taking - Pretest	Yes	14.72	4.56	16.69	4.60	4.46	0.44	16.01	4.48	16.09	4.41	0.12	0.02
Intrinsic Value Orientation - Pretest	Yes	45.50	7.89	47.84	7.05	3.32	0.21	46.80	7.40	46.89	7.26	0.09	0.01

Table Y.2

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Entire Sample PSM Without Replacement (Part 3)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n =345)		Control Group (n = 290)		Comparative Analysis		Operation Flinders (n = 141)		Control Group (n = 141)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Extrinsic Value Orientation - Pretest	Yes	26.16	7.50	27.76	7.74	2.27	0.21	26.78	7.23	26.91	7.55	0.13	0.02
BCQ YRB (Total) - Pretest	Yes	9.46	4.86	7.79	5.19	-3.80	0.33	8.49	5.06	8.45	5.07	-0.05	0.01
BCQ YRP (Total) - Pretest	Yes	5.67	4.53	4.88	4.31	-1.98	0.18	5.23	4.54	5.26	4.39	0.05	0.01
BCQ YRB-MTC (Total) - Pretest	Yes	2.13	0.82	2.16	0.83	0.28	0.03	2.16	0.85	2.17	0.83	0.04	0.01
BCQ YRB (School Avoidance) - Pretest	Yes	0.82	0.88	0.65	0.86	-2.13	0.19	0.73	0.88	0.72	0.88	-0.09	0.01
BCQ YRP (School Avoidance) - Pretest	Yes	0.45	0.76	0.42	0.72	-0.53	0.05	0.47	0.76	0.46	0.76	-0.03	0.00
BCQ YRB-MTC (School Avoidance) - Pretest	Yes	2.03	1.10	2.25	1.10	1.43	0.20	2.26	1.12	2.25	1.10	-0.03	0.01
BCQ YRB (Extern. Behaviours) - Pretest	Yes	2.86	1.81	2.16	1.89	-4.20	0.37	2.41	1.89	2.41	1.87	0.00	0.00
BCQ YRP (Extern. Behaviours) - Pretest	Yes	1.86	1.72	1.40	1.67	-2.95	0.27	1.56	1.65	1.57	1.72	0.02	0.00
BCQ YRB-MTC (Extern. Behaviours) - Pretest	Yes	2.24	0.97	2.16	0.93	-0.84	0.09	2.25	0.98	2.18	0.93	-0.47	0.08
BCQ YRB (Mental Absence) - Pretest	Yes	1.55	0.70	1.45	0.76	-1.55	0.14	1.53	0.71	1.53	0.71	0.00	0.00
BCQ YRP (Mental Absence) - Pretest	Yes	0.87	0.85	0.91	0.84	0.48	0.05	0.90	0.84	0.93	0.85	0.22	0.03
BCQ YRB-MTC (Mental Absence) - Pretest	Yes	2.04	1.00	2.17	1.00	1.38	0.14	2.10	1.01	2.13	1.00	0.15	0.02
BCQ TRP (Total) - Pretest	Yes	8.05	4.70	6.71	5.23	-2.94	0.27	7.08	4.76	7.04	5.12	-0.06	0.01
BCQ TRP-MTC (Total) - Pretest	Yes	1.44	0.86	1.30	0.90	-1.64	0.16	1.38	0.89	1.38	0.87	0.00	0.00
BCQ TRP (Class & School Avoid.) - Pretest	Yes	1.10	1.18	0.97	1.17	-1.22	0.12	1.01	1.14	1.00	1.17	-0.09	0.01
BCQ TRP-MTC (Class & School Avoid.) - Pretest	Yes	1.19	1.24	1.00	1.26	-1.10	0.15	1.22	1.33	1.09	1.30	-0.50	0.10
BCQ TRP (Work Avoidance) - Pretest	Yes	2.50	1.50	2.00	1.58	-3.46	0.32	2.14	1.54	2.14	1.57	0.02	0.00
BCQ TRP-MTC (Work Avoidance) - Pretest	Yes	1.59	1.10	1.40	1.17	-1.59	0.17	1.49	1.14	1.49	1.15	-0.01	0.00
BCQ TRP (Interpersonal Probs.) - Pretest	Yes	1.51	1.48	1.25	1.49	-1.91	0.18	1.31	1.44	1.30	1.50	-0.05	0.01
BCQ TRP-MTC (Interpersonal Probs.) - Pretest	Yes	1.25	1.12	0.99	1.10	-1.81	0.23	1.16	1.18	1.11	1.13	-0.24	0.05
Youth Problem Awareness (YPA) - Pretest	Yes	0.87	0.32	0.90	0.33	1.01	0.09	0.90	0.31	0.90	0.33	0.08	0.01
Truancy frequency - Pretest	Yes	1.14	1.70	0.79	1.39	-2.41	0.23	0.91	1.52	0.90	1.47	-0.05	0.01
Offending frequency - Pretest	Yes	0.77	1.46	0.52	1.13	-2.01	0.19	0.60	1.25	0.56	1.19	-0.24	0.03
Alcohol consumption frequency - Pretest	Yes	0.97	1.51	0.80	1.27	-1.26	0.12	0.82	1.33	0.83	1.34	0.05	0.01

Table Y.3

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Offending Risk Group - PSM with Replacement (Part 1)

	PSM Predictor	Pre-Matching						Post-Matching					
		Operation Flinders (n = 132)		Control Group (n = 61)		Comparative Analysis		Operation Flinders (n = 82)		Control Group (n = 31)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Age	Yes	14.81	1.064	14.96	1.032	0.81	0.15	14.87	1.068	14.82	1.020	-0.15	0.05
Male	Yes	90.2%	n/a	62.2%	n/a	21.57	0.33	87.6%	n/a	88.0%	n/a	0.14	0.01
Indigenous	Yes	19.2%	n/a	25.0%	n/a	1.15	0.07	21.4%	n/a	18.1%	n/a	0.66	0.04
City (versus rural)	Yes	47.5%	n/a	52.1%	n/a	0.40	0.04	50.5%	n/a	41.1%	n/a	1.45	0.09
Year level		9.53	1.05	9.75	0.91	1.18	0.22	9.60	1.04	9.61	0.88	0.04	0.01
Living with both parents		69.7%	n/a	58.9%	n/a	2.47	0.11	69.1%	n/a	61.0%	n/a	1.19	0.08
Family support	Yes	3.37	0.76	3.25	0.92	-0.90	0.15	3.31	0.78	3.32	0.82	0.04	0.01
Pre-program exclusion	Yes	33.4%	n/a	29.2%	n/a	0.57	0.04	33.5%	n/a	33.1%	n/a	0.67	0.01
Pre-program criminal conviction	Yes	57.7%	n/a	42.5%	n/a	4.03	0.14	51.2%	n/a	46.2%	n/a	1.11	0.04
Pre-program suspension	Yes	82.5%	n/a	61.8%	n/a	9.96	0.23	79.1%	n/a	79.2%	n/a	0.60	0.00
Pre-program offending	Yes	74.5%	n/a	82.4%	n/a	1.56	0.09	79.6%	n/a	84.0%	n/a	1.23	0.05
Pre-program alcohol consumption	Yes	63.9%	n/a	68.6%	n/a	0.56	0.05	69.4%	n/a	74.4%	n/a	0.78	0.05
Pre-program truancy	Yes	58.6%	n/a	60.6%	n/a	0.24	0.02	61.2%	n/a	55.2%	n/a	0.95	0.06
School suspension/exclusion 2013 (DECD)	Yes	40.0%	n/a	33.8%	n/a	1.15	0.06	38.8%	n/a	40.0%	n/a	0.69	0.01
Aspire to complete year 12		55.6%	n/a	63.4%	n/a	1.37	0.07	58.9%	n/a	58.8%	n/a	1.09	0.00
2013 FLO enrolment		16.7%	n/a	10.0%	n/a	1.31	0.08	17.4%	n/a	13.6%	n/a	1.09	0.05
Socio-economic status (IRSAD)	Yes	931.68	90.64	937.52	71.24	0.43	0.07	932.85	93.28	929.71	74.16	-0.13	0.04
School attendance rate 2013	Yes	0.79	0.17	0.78	0.16	-0.24	0.04	0.79	0.17	0.80	0.14	0.19	0.05
School unexplained absences 2013		9.36	12.49	8.50	9.93	-0.39	0.08	8.37	11.53	8.29	8.88	-0.03	0.01
School explained absences 2013	Yes	10.74	10.16	13.43	10.56	1.44	0.26	11.59	10.50	11.72	8.94	0.05	0.01
Average sleep		7.58	1.93	7.77	1.92	0.50	0.10	7.49	1.96	8.03	1.98	0.81	0.27
NAPLAN Reading	Yes	541.16	30.66	540.10	33.02	-0.21	0.03	540.20	29.90	541.27	37.15	0.11	0.03

Table Y.3

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Offending Risk Group - PSM with Replacement (Part 2)

	Pre-Matching							Post-Matching					
	Operation Flinders (n = 132)		Control Group (n = 61)		Comparative Analysis		Operation Flinders (n = 82)		Control Group (n = 31)		Comparative Analysis		
	PSM Predictor	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
NAPLAN Numeracy		539.39	28.11	537.02	26.10	-0.52	0.09	538.28	29.25	533.31	34.40	-0.51	0.16
NAPLAN Writing		451.31	74.88	459.38	53.05	0.75	0.12	449.78	73.61	460.74	44.37	0.65	0.18
NAPLAN Language Conventions		512.16	36.33	509.14	48.64	-0.47	0.07	510.55	37.47	513.40	37.26	0.27	0.08
NAPLAN Spelling		531.24	37.00	534.34	29.66	0.54	0.09	529.74	38.34	533.85	33.96	0.41	0.11
Wellbeing risk factor	Yes	59.5%	n/a	54.3%	n/a	0.87	0.05	57.8%	n/a	54.7%	n/a	0.56	0.03
Offending risk factor		100.0%	n/a	100.0%	n/a	n/a	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a
Risk present		100.0%	n/a	100.0%	n/a	n/a	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a
Program timing	Yes	3.06	1.29	2.95	1.28	-0.55	0.02	2.93	1.26	2.77	1.16	-0.43	0.13
Identification with Criminal Others - Pretest	Yes	14.11	3.85	13.83	3.09	-0.40	0.08	14.02	3.65	13.56	3.17	-0.50	0.13
Attitudes to Teachers - Pretest	Yes	22.29	5.35	22.78	4.85	0.54	0.10	22.44	5.07	22.49	5.32	0.03	0.01
Satisfaction with Life - Pretest		13.99	4.81	14.83	4.50	0.99	0.18	14.14	4.75	15.08	4.83	0.72	0.20
Optimism - Pretest		6.48	1.69	6.60	1.66	0.35	0.07	6.46	1.71	6.68	1.60	0.45	0.13
Self-Efficacy - Pretest		13.05	3.00	13.68	3.10	1.06	0.21	13.03	3.00	13.89	3.17	0.82	0.28
Aggressive Impulses - Pretest	Yes	24.41	8.26	23.75	7.90	-0.42	0.08	24.38	8.27	25.32	8.20	0.42	0.11
Attitudes to Police - Pretest	Yes	21.01	6.46	23.01	5.50	1.76	0.33	21.69	6.06	22.49	5.29	0.52	0.14
Self-Esteem - Pretest		14.30	4.00	13.72	4.29	-0.75	0.14	14.18	4.16	14.45	4.16	0.20	0.07
BASE (Total) - Pretest	Yes	46.25	10.18	45.99	10.62	-0.16	0.03	45.57	10.05	45.49	10.28	-0.03	0.01
BASE - Student Initiative - Pretest		17.18	4.22	17.23	4.63	0.08	0.01	16.92	4.15	16.94	4.45	0.01	0.00
BASE - Social Attention - Pretest		8.91	2.62	8.70	2.60	-0.48	0.08	8.75	2.57	8.25	2.48	-0.65	0.20
BASE - Success-Failure - Pretest		5.72	1.81	5.51	2.01	-0.67	0.11	5.67	1.78	5.30	1.90	-0.69	0.20
BASE - Social Attraction - Pretest		8.72	2.43	8.79	2.30	0.18	0.03	8.60	2.47	9.21	2.25	0.83	0.26
BASE - Self-Confidence - Pretest		5.72	1.65	5.78	1.61	0.23	0.04	5.62	1.65	5.80	1.59	0.37	0.11
Educational Risk Taking - Pretest		13.63	4.23	14.72	4.29	1.50	0.25	13.40	4.14	14.30	4.01	0.80	0.22
Intrinsic Value Orientation - Pretest		45.17	7.61	47.42	6.71	1.84	0.31	45.32	7.52	47.43	6.30	1.07	0.30

Table Y.3

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Offending Risk Group - PSM with Replacement (Part 3)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n = 132)		Control Group (n = 61)		Comparative Analysis		Operation Flinders (n = 82)		Control Group (n = 31)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Extrinsic Value Orientation - Pretest		27.58	7.06	29.54	7.28	1.55	0.27	27.57	7.32	30.86	6.96	1.45	0.46
BCQ YRB (Total) - Pretest	Yes	12.13	4.23	12.04	3.96	-0.13	0.02	12.25	4.29	12.18	3.75	-0.07	0.02
BCQ YRP (Total) - Pretest		7.81	4.64	8.26	4.04	0.60	0.10	8.24	4.54	8.16	4.07	-0.07	0.02
BCQ YRB-MTC (Total) - Pretest		2.23	0.76	2.26	0.63	0.22	0.04	2.29	0.73	2.25	0.67	-0.21	0.06
BCQ YRB (School Avoidance) - Pretest		1.22	0.84	1.39	0.80	1.23	0.20	1.23	0.83	1.31	0.83	0.36	0.10
BCQ YRP (School Avoidance) - Pretest		0.69	0.83	0.89	0.83	1.37	0.24	0.74	0.84	0.80	0.82	0.26	0.08
BCQ YRB-MTC (School Avoidance) - Pretest		2.07	1.09	2.18	0.99	0.56	0.11	2.15	1.09	2.11	0.99	-0.09	0.03
BCQ YRB (Extern. Behaviours) - Pretest		3.65	1.48	3.58	1.48	-0.28	0.05	3.67	1.52	3.79	1.36	0.28	0.08
BCQ YRP (Extern. Behaviours) - Pretest		2.51	1.70	2.68	1.61	0.55	0.10	2.63	1.69	2.81	1.60	0.39	0.11
BCQ YRB-MTC (Extern. Behaviours) - Pretest		2.29	0.86	2.36	0.82	0.45	0.08	2.34	0.83	2.37	0.84	0.13	0.04
BCQ YRB (Mental Absence) - Pretest		1.65	0.60	1.71	0.60	0.56	0.10	1.66	0.58	1.74	0.57	0.44	0.14
BCQ YRP (Mental Absence) - Pretest		1.05	0.86	1.18	0.81	0.85	0.15	1.14	0.85	1.22	0.78	0.31	0.09
BCQ YRB-MTC (Mental Absence) - Pretest		2.12	0.98	2.27	0.94	0.88	0.16	2.19	0.98	2.29	0.96	0.35	0.11
BCQ TRP (Total) - Pretest		9.10	4.26	8.58	4.98	-0.71	0.11	9.38	4.26	9.81	5.22	0.33	0.09
BCQ TRP-MTC (Total) - Pretest		1.69	0.78	1.78	0.73	0.69	0.12	1.75	0.78	1.79	0.76	0.17	0.05
BCQ TRP (Class & School Avoid.) - Pretest		1.26	1.21	1.38	1.22	0.59	0.10	1.31	1.23	1.40	1.20	0.26	0.07
BCQ TRP-MTC (Class & School Avoid.) - Pretest		1.57	1.25	1.52	1.15	-0.20	0.05	1.61	1.25	1.31	1.21	-0.60	0.24
BCQ TRP (Work Avoidance) - Pretest		2.80	1.39	2.39	1.50	-1.70	0.28	2.86	1.36	2.73	1.47	-0.32	0.10
BCQ TRP-MTC (Work Avoidance) - Pretest		1.80	1.03	1.87	1.09	0.34	0.06	1.86	1.04	1.85	1.02	-0.01	0.00
BCQ TRP (Interpersonal Probs.) - Pretest	Yes	1.75	1.49	1.84	1.55	0.37	0.06	1.87	1.51	2.22	1.60	0.78	0.22
BCQ TRP-MTC (Interpersonal Probs.) - Pretest		1.53	1.07	1.55	1.03	0.10	0.02	1.53	1.06	1.61	1.00	0.23	0.07
Youth Problem Awareness (YPA) - Pretest	Yes	0.93	0.35	0.98	0.34	0.94	0.16	0.94	0.36	0.91	0.37	-0.27	0.08
Truancy frequency - Pretest	Yes	1.81	1.90	1.61	1.65	-0.63	0.11	1.79	1.83	1.46	1.67	-0.64	0.19
Offending frequency - Pretest	Yes	2.01	1.76	1.78	1.47	-0.83	0.14	1.98	1.61	1.97	1.58	-0.03	0.01
Alcohol consumption frequency - Pretest		1.68	1.72	1.67	1.60	-0.05	0.01	1.83	1.72	2.08	1.84	0.47	0.14

Table Y.4

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Educational Disengag... Risk Group - PSM with Replacement (Part 1)

	PSM Predictor	Pre-Matching						Post-Matching					
		Operation Flinders (n = 135)		Control Group (n = 64)		Comparative Analysis		Operation Flinders (n = 100)		Control Group (n = 37)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Age	Yes	15.03	1.045	15.04	1.141	0.07	0.01	15.03	1.029	15.03	1.206	0.01	0.00
Male	Yes	76.7%	n/a	50.9%	n/a	13.38	0.26	73.7%	n/a	73.1%	n/a	0.32	0.01
Indigenous	Yes	27.3%	n/a	29.5%	n/a	0.41	0.02	28.5%	n/a	28.5%	n/a	0.55	0.00
City (versus rural)	Yes	45.0%	n/a	46.7%	n/a	0.11	0.02	44.5%	n/a	47.8%	n/a	0.56	0.03
Year level	Yes	9.72	1.01	9.85	1.03	0.77	0.13	9.74	1.00	9.68	1.16	-0.24	-0.05
Living with both parents	Yes	66.5%	n/a	65.1%	n/a	0.29	0.01	66.8%	n/a	70.3%	n/a	0.82	0.03
Level of support provided by family	Yes	3.24	0.84	3.27	0.85	0.19	0.03	3.25	0.83	3.37	0.82	0.60	0.15
Pre-program exclusion	Yes	25.2%	n/a	27.2%	n/a	0.33	0.02	26.4%	n/a	27.4%	n/a	0.46	0.01
Pre-program criminal conviction		31.6%	n/a	26.8%	n/a	0.70	0.05	31.3%	n/a	26.9%	n/a	1.08	0.05
Pre-program suspension	Yes	73.1%	n/a	62.7%	n/a	2.51	0.11	71.2%	n/a	69.7%	n/a	0.28	0.01
Broken law in month prior to program		45.7%	n/a	49.3%	n/a	0.41	0.03	45.4%	n/a	40.4%	n/a	0.74	0.04
Consumed alcohol in month prior to program		58.7%	n/a	63.7%	n/a	0.60	0.05	58.6%	n/a	62.2%	n/a	0.41	0.03
Truanted in month prior to program	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a
Suspended or excluded in 2013 (DECD data)	Yes	31.5%	n/a	25.8%	n/a	1.01	0.06	30.7%	n/a	28.6%	n/a	0.66	0.02
Aspire to complete year 12	Yes	61.2%	n/a	63.9%	n/a	0.50	-0.03	62.1%	n/a	70.4%	n/a	1.17	0.07
2013 FLO enrolment	Yes	11.5%	n/a	7.9%	n/a	0.89	0.06	9.6%	n/a	8.3%	n/a	0.50	0.02
Socio-economic status (IRSAD)	Yes	921.04	94.82	927.38	72.55	0.45	0.08	920.66	95.80	924.14	77.33	0.17	0.04
Days attended school in 2013	Yes	0.76	0.18	0.76	0.16	-0.11	0.02	0.77	0.18	0.78	0.15	0.25	0.06
Number of non-authorised absences 2013	Yes	11.79	13.38	10.32	11.18	-0.72	0.12	11.18	12.71	10.48	11.38	-0.24	0.06
Number of authorised absences 2013		10.87	9.73	13.54	10.36	1.56	0.27	11.10	9.75	12.26	9.18	0.43	0.12
Average sleep previous week	Yes	7.46	1.98	7.21	1.95	-0.68	0.12	7.45	2.03	7.45	1.87	-0.01	0.00
NAPLAN Reading	Yes	540.89	29.95	541.16	30.75	0.05	0.01	540.57	29.33	540.02	26.67	-0.08	0.02

Table Y.4

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Educational Disengag... Risk Group - PSM with Replacement (Part 2)

	Pre-Matching							Post-Matching					
	Operation Flinders (n = 135)		Control Group (n = 64)		Comparative Analysis			Operation Flinders (n=100)		Control Group (n = 37)		Comparative Analysis	
	PSM Predictor	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
NAPLAN Numeracy		538.48	26.63	536.05	29.00	-0.55	0.09	538.05	27.44	527.50	35.43	-1.27	0.33
NAPLAN Writing		455.28	63.36	463.56	57.82	0.87	0.14	455.84	62.35	446.25	85.27	-0.53	0.13
NAPLAN Language Conventions		512.31	36.48	508.13	48.37	-0.65	0.10	512.03	36.71	506.34	34.65	-0.66	0.16
NAPLAN Spelling		532.53	32.06	536.35	27.23	0.79	0.13	531.87	33.73	531.55	30.64	-0.04	0.01
Wellbeing risk factor		54.6%	n/a	61.1%	n/a	1.24	0.06	53.6%	n/a	45.4%	n/a	1.44	0.07
Offending risk factor	Yes	57.2%	n/a	57.3%	n/a	0.17	0.00	56.8%	n/a	49.0%	n/a	1.13	0.07
Risk present		100.0%	n/a	100.0%	n/a	n/a	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a
Program timing		3.17	1.34	2.98	1.31	-0.89	0.03	3.20	1.33	3.01	1.40	-0.66	0.14
Identification with Criminal Others - Pretest		13.42	3.32	13.04	3.61	-0.62	0.11	13.29	3.25	12.30	3.34	-1.18	0.30
Attitudes to Teachers - Pretest	Yes	22.74	4.92	22.71	4.90	-0.03	0.00	22.76	4.99	23.58	4.95	0.72	0.16
Satisfaction with Life - Pretest		14.24	4.65	14.38	4.60	0.16	0.03	14.43	4.62	15.64	4.70	0.99	0.26
Optimism - Pretest	Yes	6.62	1.57	6.53	1.76	-0.28	0.05	6.66	1.59	6.78	1.71	0.31	0.07
Self-Efficacy - Pretest	Yes	13.02	2.80	13.23	3.17	0.38	0.07	13.15	2.86	13.24	3.17	0.12	0.03
Aggressive Impulses - Pretest	Yes	23.63	8.08	23.38	7.99	-0.16	0.03	23.31	7.97	23.15	8.33	-0.09	0.02
Attitudes to Police - Pretest		22.20	5.92	23.38	5.46	1.11	0.21	22.50	5.94	23.96	4.96	0.97	0.27
Self-Esteem - Pretest		14.11	3.98	13.52	4.38	-0.79	0.14	14.26	4.03	14.42	4.31	0.16	0.04
BASE (Total) - Pretest	Yes	45.81	10.30	46.80	11.16	0.59	0.09	45.91	10.49	47.60	11.55	0.64	0.15
BASE - Student Initiative - Pretest		16.84	4.31	17.62	4.82	1.03	0.17	16.94	4.37	17.64	4.96	0.63	0.15
BASE - Social Attention - Pretest		9.04	2.53	9.02	2.49	-0.04	0.01	9.00	2.56	9.24	2.41	0.40	0.10
BASE - Success-Failure - Pretest		5.63	1.85	5.59	1.94	-0.14	0.02	5.60	1.86	5.73	1.94	0.26	0.07
BASE - Social Attraction - Pretest		8.50	2.38	8.62	2.48	0.33	0.05	8.54	2.40	9.00	2.54	0.74	0.19
BASE - Self-Confidence - Pretest		5.79	1.65	5.96	1.61	0.63	0.10	5.82	1.67	6.01	1.64	0.45	0.11
Educational Risk Taking - Pretest	Yes	13.43	4.29	14.62	4.20	1.59	0.28	13.63	4.34	14.24	4.23	0.57	0.14
Intrinsic Value Orientation - Pretest		44.33	7.71	46.21	7.17	1.50	0.25	44.48	7.62	46.54	6.80	1.14	0.29

Table Y.4

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Educational Disengag... Risk Group - PSM with Replacement (Part 3)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n = 135)		Control Group (n = 64)		Comparative Analysis		Operation Flinders (n = 100)		Control Group (n = 37)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Extrinsic Value Orientation - Pretest		26.32	7.70	27.18	6.70	0.70	0.12	26.29	7.65	27.17	7.03	0.49	0.12
BCQ YRB (Total) - Pretest	Yes	12.49	4.04	12.00	4.25	-0.76	0.12	12.31	4.14	11.95	4.37	-0.37	0.08
BCQ YRP (Total) - Pretest		7.77	4.83	8.08	4.33	0.42	0.07	7.86	4.83	7.76	4.31	-0.09	0.02
BCQ YRB-MTC (Total) - Pretest		2.18	0.77	2.24	0.63	0.52	0.09	2.21	0.76	2.23	0.64	0.13	0.03
BCQ YRB (School Avoidance) - Pretest		1.51	0.69	1.51	0.75	-0.04	0.01	1.49	0.71	1.48	0.79	-0.08	0.02
BCQ YRP (School Avoidance) - Pretest		0.86	0.89	1.03	0.84	1.18	0.19	0.88	0.89	0.99	0.87	0.43	0.12
BCQ YRB-MTC (School Avoidance) - Pretest		2.02	1.05	2.39	1.07	1.97	0.35	2.05	1.05	2.40	1.10	1.09	0.33
BCQ YRB (Extern. Behaviours) - Pretest		3.68	1.54	3.37	1.63	-1.21	0.19	3.61	1.58	3.50	1.55	-0.28	0.07
BCQ YRP (Extern. Behaviours) - Pretest		2.43	1.69	2.45	1.77	0.07	0.01	2.43	1.70	2.50	1.75	0.16	0.04
BCQ YRB-MTC (Extern. Behaviours) - Pretest		2.20	0.85	2.30	0.84	0.65	0.12	2.23	0.84	2.36	0.86	0.52	0.16
BCQ YRB (Mental Absence) - Pretest		1.65	0.61	1.73	0.61	0.75	0.13	1.64	0.61	1.66	0.70	0.13	0.03
BCQ YRP (Mental Absence) - Pretest		0.96	0.85	1.18	0.84	1.38	0.25	1.00	0.85	1.13	0.87	0.51	0.14
BCQ YRB-MTC (Mental Absence) - Pretest		2.09	1.01	2.22	0.89	0.72	0.13	2.14	1.02	2.19	0.90	0.20	0.05
BCQ TRP (Total) - Pretest	Yes	9.41	4.34	8.67	4.77	-1.00	0.16	9.24	4.43	9.02	4.68	-0.19	0.05
BCQ TRP-MTC (Total) - Pretest	Yes	1.74	0.83	1.80	0.78	0.38	0.07	1.76	0.84	1.74	0.79	-0.10	0.03
BCQ TRP (Class & School Avoid.) - Pretest	Yes	1.55	1.21	1.47	1.18	-0.43	0.07	1.50	1.22	1.46	1.17	-0.14	0.03
BCQ TRP-MTC (Class & School Avoid.) - Pretest		1.72	1.17	1.84	1.25	0.51	0.11	1.72	1.19	1.93	1.38	0.52	0.16
BCQ TRP (Work Avoidance) - Pretest	Yes	2.79	1.40	2.49	1.48	-1.25	0.21	2.77	1.41	2.72	1.42	-0.15	0.04
BCQ TRP-MTC (Work Avoidance) - Pretest		1.84	1.07	1.94	1.02	0.51	0.09	1.87	1.09	1.86	1.02	-0.02	0.01
BCQ TRP (Interpersonal Probs.) - Pretest	Yes	1.70	1.50	1.72	1.56	0.07	0.01	1.71	1.51	1.67	1.62	-0.11	0.03
BCQ TRP-MTC (Interpersonal Probs.) - Pretest		1.46	1.04	1.47	1.07	0.04	0.01	1.46	1.07	1.68	1.03	0.67	0.21
Youth Problem Awareness (YPA) - Pretest	Yes	0.91	0.35	0.97	0.29	1.05	0.18	0.92	0.35	0.93	0.27	0.08	0.02
Truancy frequency - Pretest	Yes	2.91	1.50	2.56	1.33	-1.44	0.25	2.84	1.49	2.80	1.41	-0.10	0.02
Offending frequency - Pretest		1.30	1.73	1.04	1.34	-0.96	0.17	1.24	1.67	0.81	1.19	-1.25	0.30
Alcohol consumption frequency - Pretest	Yes	1.58	1.77	1.45	1.49	-0.45	0.08	1.56	1.74	1.33	1.47	-0.59	0.14

Table Y.5

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Wellbeing Risk Group - PSM with Replacement (Part 1)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n = 176)		Control Group (n = 95)		Comparative Analysis		Operation Flinders (n = 134)		Control Group (n = 54)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Age	Yes	14.93	1.038	14.93	1.035	-0.03	0.00	14.95	1.005	14.93	0.980	-0.09	0.02
Male	Yes	67.7%	n/a	47.2%	n/a	10.77	0.20	63.0%	n/a	59.1%	n/a	0.90	0.03
Indigenous	Yes	17.9%	n/a	16.6%	n/a	0.26	0.02	17.0%	n/a	13.0%	n/a	1.12	0.05
City (versus rural)	Yes	52.7%	n/a	48.7%	n/a	0.44	0.04	52.8%	n/a	51.3%	n/a	0.47	0.01
Year level	Yes	9.64	1.00	9.67	0.89	0.22	0.03	9.65	0.98	9.62	0.88	-0.16	0.03
Living with both parents	Yes	65.5%	n/a	60.3%	n/a	0.83	0.05	64.3%	n/a	67.8%	n/a	0.92	0.03
Family support	Yes	3.24	0.79	3.22	0.78	-0.14	0.02	3.21	0.79	3.19	0.82	-0.13	0.03
Pre-program exclusion	Yes	22.1%	n/a	20.1%	n/a	0.30	0.02	20.6%	n/a	16.9%	n/a	0.75	0.04
Pre-program criminal conviction	Yes	29.0%	n/a	17.2%	n/a	4.67	0.13	23.6%	n/a	18.9%	n/a	1.07	0.05
Pre-program suspension	Yes	70.3%	n/a	50.1%	n/a	10.90	0.20	66.0%	n/a	62.0%	n/a	1.00	0.04
Pre-program offending	Yes	32.7%	n/a	28.4%	n/a	0.73	0.04	30.9%	n/a	24.8%	n/a	1.39	0.06
Pre-program alcohol consumption	Yes	44.1%	n/a	48.2%	n/a	0.61	0.04	45.3%	n/a	39.3%	n/a	0.94	0.05
Pre-program truancy	Yes	42.0%	n/a	41.5%	n/a	0.22	0.01	41.1%	n/a	35.3%	n/a	1.20	0.05
School suspension/exclusion 2013 (DECD)	Yes	32.5%	n/a	22.1%	n/a	3.56	0.11	30.1%	n/a	24.0%	n/a	1.03	0.06
Aspire to complete year 12	Yes	69.7%	n/a	65.9%	n/a	0.62	0.04	68.9%	n/a	71.4%	n/a	0.43	0.03
2013 FLO enrolment	Yes	14.5%	n/a	9.6%	n/a	1.18	0.06	12.3%	n/a	12.8%	n/a	0.52	0.01
Socio-economic status (IRSAD)	Yes	934.87	79.86	933.74	60.51	-0.11	0.02	935.01	80.36	940.30	64.55	0.34	0.07
School attendance rate 2013	Yes	0.79	0.18	0.81	0.15	0.58	0.08	0.80	0.17	0.83	0.14	0.67	0.13
School unexplained absences 2013	Yes	8.71	11.56	6.92	9.12	-1.14	0.17	7.80	10.48	6.44	8.70	-0.70	0.14
School explained absences 2013	Yes	11.41	11.70	12.38	10.14	0.59	0.09	11.50	12.00	10.89	8.82	-0.28	0.06
Average sleep	Yes	7.41	1.91	7.26	1.87	-0.54	0.08	7.38	1.93	7.47	1.94	0.22	0.05
NAPLAN Reading	Yes	545.84	24.59	545.77	30.58	-0.02	0.00	545.94	24.91	549.98	34.90	0.60	0.13

Table Y.5

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Wellbeing Risk Group - PSM with Replacement (Part 2)

	PSM Predictor	Pre-Matching						Post-Matching					
		Operation Flinders (n = 176)		Control Group (n = 95)		Comparative Analysis		Operation Flinders (n = 134)		Control Group (n = 54)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
NAPLAN Numeracy	Yes	541.27	26.22	536.18	24.84	-1.38	0.20	541.46	27.29	536.33	26.51	-0.82	0.19
NAPLAN Writing		462.53	62.58	470.52	44.40	1.08	0.15	463.86	59.84	468.75	44.34	0.48	0.09
NAPLAN Language Conventions		514.34	35.11	515.48	53.28	0.20	0.03	514.89	36.44	523.46	52.45	0.92	0.19
NAPLAN Spelling		537.98	32.02	534.76	30.66	-0.74	0.10	538.93	31.38	535.48	31.19	-0.49	0.11
Wellbeing risk factor	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a
Offending risk factor	Yes	44.8%	n/a	34.8%	n/a	2.60	0.10	39.5%	n/a	32.4%	n/a	1.78	0.07
Risk present	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a	100.0%	n/a	100.0%	n/a	n/a	n/a
Program timing	Yes	3.12	1.26	3.06	1.22	0.31	0.01	3.13	1.25	3.18	1.21	0.19	0.04
Identification with Criminal Others - Pretest	Yes	13.19	3.87	12.47	3.59	-1.40	0.19	13.06	3.78	12.89	3.26	-0.23	0.05
Attitudes to Teachers - Pretest	Yes	22.87	4.98	23.09	5.00	0.33	0.04	22.89	4.86	22.86	5.08	-0.03	0.01
Satisfaction with Life - Pretest	Yes	11.20	3.01	11.38	2.98	0.45	0.06	11.21	3.04	11.26	3.16	0.09	0.02
Optimism - Pretest	Yes	6.06	1.58	5.98	1.57	-0.38	0.05	6.02	1.55	5.88	1.61	-0.43	0.09
Self-Efficacy - Pretest	Yes	12.51	2.98	12.50	3.18	-0.03	0.00	12.53	2.98	12.32	3.06	-0.32	0.07
Aggressive Impulses - Pretest	Yes	23.62	8.57	23.07	8.03	-0.47	0.07	23.39	8.41	22.48	8.41	-0.52	0.11
Attitudes to Police - Pretest	Yes	23.09	5.96	23.68	5.53	0.74	0.10	23.23	5.79	23.37	6.08	0.10	0.02
Self-Esteem - Pretest	Yes	12.96	3.67	12.11	3.70	-1.58	0.23	12.78	3.66	12.69	3.50	-0.11	0.02
BASE (Total) - Pretest	Yes	47.19	10.42	49.21	11.28	1.40	0.19	47.67	10.20	47.47	11.12	-0.08	0.02
BASE - Student Initiative - Pretest		17.63	4.35	18.41	4.69	1.26	0.17	17.91	4.27	17.59	4.58	-0.32	0.07
BASE - Social Attention - Pretest		9.33	2.49	9.71	2.64	1.05	0.15	9.41	2.42	9.51	2.69	0.19	0.04
BASE - Success-Failure - Pretest		5.77	1.85	5.97	1.96	0.71	0.10	5.82	1.80	5.84	1.94	0.05	0.01
BASE - Social Attraction - Pretest		8.44	2.43	8.96	2.48	1.50	0.21	8.46	2.43	8.68	2.40	0.45	0.09
BASE - Self-Confidence - Pretest		6.00	1.65	6.18	1.77	0.70	0.10	6.05	1.61	5.86	1.78	-0.50	0.11
Educational Risk Taking - Pretest	Yes	14.48	4.26	15.91	4.32	2.22	0.33	14.84	4.16	15.03	4.14	0.20	0.05
Intrinsic Value Orientation - Pretest	Yes	44.26	8.45	45.27	7.81	0.90	0.12	44.29	8.49	44.57	7.72	0.17	0.04

Table Y.5

Pre- and Post-Matching of Static Risk, Predictor and Dependent Covariates (n = 71) – Wellbeing Risk Group - PSM with Replacement (Part 3)

	Pre-Matching							Post-Matching					
	PSM Predictor	Operation Flinders (n = 176)		Control Group (n = 95)		Comparative Analysis		Operation Flinders (n = 134)		Control Group (n = 54)		Comparative Analysis	
		Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size	Mean/%	SD	Mean/%	SD	t / χ^2	Effect Size
Extrinsic Value Orientation - Pretest	Yes	25.25	7.45	26.82	8.01	1.50	0.20	25.53	7.53	25.30	7.65	-0.15	0.03
BCQ YRB (Total) - Pretest	Yes	10.52	4.48	9.60	4.81	-1.49	0.20	10.28	4.58	9.75	4.59	-0.58	0.12
BCQ YRP (Total) - Pretest	Yes	6.40	4.32	6.04	4.49	-0.61	0.08	6.21	4.34	5.81	4.37	-0.45	0.09
BCQ YRB-MTC (Total) - Pretest	Yes	2.20	0.81	2.16	0.76	-0.40	0.05	2.21	0.82	2.16	0.76	-0.23	0.06
BCQ YRB (School Avoidance) - Pretest	Yes	0.97	0.89	0.90	0.89	-0.60	0.08	0.93	0.89	0.81	0.86	-0.58	0.13
BCQ YRP (School Avoidance) - Pretest		0.54	0.80	0.57	0.79	0.27	0.04	0.52	0.79	0.55	0.80	0.23	0.05
BCQ YRB-MTC (School Avoidance) - Pretest		2.06	1.12	2.23	1.10	0.81	0.15	2.09	1.14	2.26	1.08	0.55	0.15
BCQ YRB (Extern. Behaviours) - Pretest	Yes	3.16	1.75	2.71	1.89	-1.79	0.24	3.06	1.80	2.87	1.78	-0.57	0.11
BCQ YRP (Extern. Behaviours) - Pretest		2.15	1.70	1.76	1.79	-1.64	0.22	2.07	1.70	1.69	1.72	-1.05	0.22
BCQ YRB-MTC (Extern. Behaviours) - Pretest		2.37	0.95	2.13	0.89	-1.78	0.26	2.39	0.97	2.06	0.88	-1.50	0.37
BCQ YRB (Mental Absence) - Pretest	Yes	1.68	0.59	1.72	0.55	0.47	0.06	1.71	0.57	1.71	0.57	0.06	0.01
BCQ YRP (Mental Absence) - Pretest		0.99	0.86	1.08	0.82	0.89	0.12	1.01	0.86	0.99	0.82	-0.07	0.01
BCQ YRB-MTC (Mental Absence) - Pretest		2.09	1.02	2.15	0.95	0.46	0.06	2.10	1.02	2.08	0.94	-0.11	0.02
BCQ TRP (Total) - Pretest	Yes	8.28	4.45	7.59	5.05	-1.05	0.14	8.07	4.55	7.40	4.89	-0.65	0.14
BCQ TRP-MTC (Total) - Pretest	Yes	1.57	0.79	1.49	0.83	-0.67	0.09	1.57	0.81	1.48	0.80	-0.50	0.11
BCQ TRP (Class & School Avoid.) - Pretest	Yes	1.10	1.17	1.12	1.21	0.12	0.02	1.09	1.16	0.92	1.15	-0.71	0.15
BCQ TRP-MTC (Class & School Avoid.) - Pretest	Yes	1.32	1.27	1.08	1.19	-1.08	0.20	1.31	1.28	1.04	1.15	-0.75	0.22
BCQ TRP (Work Avoidance) - Pretest	Yes	2.52	1.48	2.14	1.54	-1.83	0.25	2.43	1.52	2.24	1.53	-0.53	0.13
BCQ TRP-MTC (Work Avoidance) - Pretest	Yes	1.72	1.11	1.70	1.08	-0.13	0.02	1.73	1.15	1.79	0.99	0.23	0.06
BCQ TRP (Interpersonal Probs.) - Pretest	Yes	1.51	1.45	1.46	1.55	-0.24	0.03	1.49	1.44	1.32	1.57	-0.51	0.11
BCQ TRP-MTC (Interpersonal Probs.) - Pretest	Yes	1.48	1.15	1.04	1.08	-2.04	0.39	1.48	1.17	1.07	1.08	-1.30	0.37
Youth Problem Awareness (YPA) - Pretest	Yes	0.90	0.31	0.91	0.33	0.40	0.06	0.90	0.31	0.91	0.32	0.25	0.05
Truancy frequency - Pretest	Yes	1.21	1.73	0.99	1.46	-0.97	0.14	1.12	1.65	0.88	1.43	-0.74	0.16
Offending frequency - Pretest	Yes	0.87	1.51	0.66	1.28	-1.05	0.15	0.80	1.45	0.63	1.30	-0.59	0.12
Alcohol consumption frequency - Pretest	Yes	1.03	1.49	1.06	1.39	0.13	0.02	1.03	1.45	0.85	1.30	-0.61	0.13

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 1)

Variable Name	Type		Definition	Desired Functioning^a
Age	Categorical	Youth-report	Participant age as reported by young people, and cross-validated with teacher-report data when this data was missing on the youth-report questionnaire.	n/a
Sex	Dichotomous	Youth-report	Participant sex (male versus female), and cross-validated with teacher-report data when this data was missing on the youth-report questionnaire.	n/a
Indigenous	Dichotomous	Youth-report	A young person's identification as Aboriginal or Torres Strait Islander.	n/a
Rural (versus city)	Dichotomous	Background data	Participant school postcodes designating suburbs greater than 50km from the metropolitan centres of Adelaide or Darwin were coded as "rural".	n/a
Year level	Categorical	Youth-report	School year level of participant as reported by young people, and cross-validated with teacher-report data when this data was missing on the youth-report questionnaire.	n/a
Living both parents	Dichotomous	Youth-report	Participants reported residing with both parents at the start of the program.	n/a
Family support	1-item, 4-point continuous scale	Youth-report	Participants rating of the degree of support provided by their family. Higher scores represent increased levels of family support.	n/a
Pre-program exclusion	Dichotomous	Youth-report	Participants reported being excluded from school on one or more occasion before the start of the Operation Flinders program.	n/a
Pre-program criminal conviction	Dichotomous	Youth-report	Participants reported being subject to a criminal conviction on one or more occasion before the start of the Operation Flinders program.	n/a
Pre-program suspension	Dichotomous	Youth-report	Participants reported being suspended from school on one or more occasion before the start of the Operation Flinders program.	n/a

^aDesired functioning is only specified for outcome variables applied within the research.

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 2)

Variable Name	Type		Definition	Desired Functioning^a
Alcohol consumption frequency	1-item, 6-point categorical scale	Youth-report	Measure of the presence and frequency of alcohol consumption (relating to separate occasions) in the previous month.	Lower scores
Pre-program alcohol consumption	Dichotomous	Youth-report	Youth-reported alcohol consumption (relating to at least one occasion) in the previous month (0 = no, 1 = yes).	n/a
Truancy frequency	1-item, 6-point categorical scale	Youth-report	Measure of the presence and frequency of school truancy in the previous month.	Lower scores
Pre-program truancy	Dichotomous	Youth-report	Youth-reported school truancy in the previous month (0 = no, 1 = yes).	n/a
Offending frequency	1-item, 6-point categorical scale	Youth-report	Measure of the presence and frequency of recent offending behaviour, or breaking the law, in the previous month.	Lower scores
Pre-program offending	Dichotomous	Youth-report	Youth-reported breaking the law in the previous month (0 = no, 1 = yes).	n/a
Aspire to complete Year 12	Dichotomous	Youth-report	Aspiration to complete High School education to the end of Year 12.	Higher scores
2013 FLO Enrolment	Dichotomous	Youth-report	Young person was enrolled in a Flexible Learning Option (FLO) program in 2013. This is an alternative educational program, and offers increased levels of support.	n/a
Socio-Economic Status (SES)	ABS (2011) Index	School post-code	Index of Relative Socio-economic Advantage and Disadvantage (IRSAD). Lower scores represent greater area disadvantage and a lack of advantage overall.	n/a
School suspension/exclusion (DECD)	Dichotomous	DECD Data ^b	The presence of suspension or exclusion on a student's electronic record during Term 2 of the school term.	Lower scores

^aDesired functioning is only specified for outcome variables applied within the study. ^bDepartment of Education and Child Development (DECD) electronically coded data.

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 3)

Variable Name	Type		Definition	Desired Functioning^a
Left school within 12 months	Dichotomous	DECD Data ^b	The electronic recording of whether or not a young person was no longer enrolled in school within 12 months of the completion of the Operation Flinders program.	Lower scores
School unexplained absences	Frequency	DECD Data ^b	Number of days a young person did not attend school where this attendance was not explained or accounted for by the reporting school (recorded electronically - Term 1 & 2).	Lower scores
School explained absences	Frequency	DECD Data ^b	Number of days a young person did not attend school where this attendance was explained or accounted for by the reporting school (recorded electronically - Term 1 & 2).	Lower scores/ Higher scores
School attendance rate	Proportion (%)	DECD Data ^b	Number of days a young person attended school, as a proportion of the total number of possible school days (recorded electronically - Term 1 & 2).	Higher scores
NAPLAN - Reading	Standardised scale	DECD Data ^b	Achievement level specific to reading English.	n/a
NAPLAN - Numeracy	Standardised scale	DECD Data ^b	Achievement level specific to numeracy (arithmetic or mathematics).	n/a
NAPLAN - Writing	Standardised scale	DECD Data ^b	Achievement level specific to writing English.	n/a
NAPLAN – Language Conventions	Standardised scale	DECD Data ^b	Achievement level specific to spelling, grammar and punctuation (English based).	n/a
NAPLAN – Spelling	Standardised scale	DECD Data ^b	Achievement level specific to spelling English.	n/a
Wellbeing risk factor	Dichotomous	Youth-report	This risk factor was present for young people that scored at or below the median score on the Satisfaction with Life measure.	n/a

^aDesired functioning is only specified for outcome variables applied within the research. ^bDepartment of Education and Child Development (DECD) electronically coded data.

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 4)

Variable Name	Type	Type	Definition	Desired Functioning^a
Offending risk factor	Dichotomous	Youth-report	This risk factor was present for young people that reported one or both of the following: (1) pre-program criminal conviction or (2) pre-program breaking the law.	n/a
Risk present	Dichotomous	Youth-report	This risk factor was present for young people exhibiting at least one of the following: (1) offending risk factor, (2) wellbeing risk factor or (3) pre-program truancy.	n/a
Average sleep	Frequency	Youth-report	The number of hours sleep reported by a young person as averaged out over the previous week (assessed pre-program).	n/a
Program timing	Categorical	n/a	The Operation Flinders program was delivered in five waves in 2013 (spanning March to September), with each wave categorised from 1 to 5.	n/a
Identification with Criminal Others	5-item Likert Scale	Youth-report	Attitudinal measure of a young person's identification with other people who break the law or engage in criminal behaviour.	Lower scores
Attitudes to Police	7-item Likert scale	Youth-report	Attitudinal measure of a young person's attitudes to police.	Higher scores
Attitudes to Teachers	7-item Likert scale	Youth-report	Attitudinal measure of a young person's attitudes to teachers.	Higher scores
Aggressive Impulses	8-item Likert scale	Youth-report	Behavioural measure of a young person's recent experiences of aggression and anger expressed outwardly.	Lower scores
Satisfaction with Life	8-item Likert scale	Youth-report	Attitudinal measure of a young person's satisfaction with their overall life.	Higher scores
Self-Efficacy	8-item Likert scale	Youth-report	Attitudinal measure of a young person's perceptions or beliefs in their ability to influence future outcomes across their life (global assessment).	Higher scores

^aDesired functioning is only specified for outcome variables applied within the research.

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 5)

Variable Name	Type		Definition	Desired Functioning^a
Self-Esteem	8-item Likert scale	Youth-report	Attitudinal measure of a young person's perceptive or belief about their self-worth.	Higher scores
Optimism	2-item Likert scale	Youth-report	Attitudinal measure of a young person's hopefulness or confidence in the future, and positive future success.	Higher scores
Intrinsic Value Orientation	12-item Continuous scale	Youth-report	Attitudinal measure tapping the degree a young person identifies with, considers important or values positive health, relationships, personal growth and community.	Higher scores
Extrinsic Value Orientation	9-item Continuous scale	Youth-report	Attitudinal measure tapping the degree a young person identifies with, considers important or values wealth, fame or image.	Lower scores
Educational Risk Taking	5-item Likert scale	Teacher-report	Behavioural measure of a young person's observed willingness to explore or attempt novel educational activities.	Higher scores
Behavioral Academic Self-Esteem (BASE)	16-item Likert scale	Teacher-report	Behavioural measure of self-confidence, coping ability and self-esteem within the classroom setting.	Higher scores
BASE - Student Initiative	6-item Likert scale	Teacher-report	Behavioural measure of a student's willingness and initiative to engage in a range of classroom activities.	Higher scores
BASE - Social Attention	3-item Likert scale	Teacher-report	Behavioural measure of a student's cooperation and willingness to engage in behaviours associated with classroom learning.	Higher scores
BASE - Success-Failure	2-item Likert scale	Teacher-report	Behavioural measure of a student's ability to cope with his/her mistakes and deal with teacher feedback.	Higher scores
BASE - Social Attraction	2-item Likert scale	Teacher-report	Behavioural measure of a student's social attractiveness or willingness to act with his/her peers in a prosocial manner.	Higher scores

^aDesired functioning is only specified for outcome variables applied within the research.

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 6)

Variable Name	Type	Definition	Desired Functioning^a	
BASE - Self-Confidence	2-item Likert scale	Teacher-report	Behavioural measure of a student's willingness to express opinions (in an appropriate manner) and appreciate the products of his/her works.	Higher scores
BCQ (YRP) Total	18-item dichotomous scale (frequency)	Youth-report	Checklist of 18 behaviours exhibited within school and classroom settings that are indicative of educational disengagement, and assessed by the youth as representing a "problem".	n/a
Classroom Avoidance (YRP)	2-item dichotomous scale (frequency)	Youth-report	Checklist of classroom avoidant behaviour that includes wagging school and skipping class, and assessed by the youth as representing a "problem".	n/a
Externalising Problems (YRP)	7-item dichotomous scale (frequency)	Youth-report	Checklist of behaviours directed externally to teachers and peers, including anger, swearing, work refusal, aggression and bullying, and assessed by the youth as representing a "problem".	n/a
Mental Absence (YRP)	2-item dichotomous scale (frequency)	Youth-report	Checklist of tiredness and daydreaming behaviour exhibited within school and classroom settings, and assessed by the youth as representing a "problem".	n/a
BCQ Youth Report Behaviours (YRB) Total	18-item dichotomous scale (frequency)	Youth-report	Checklist of 18 behaviours exhibited within school and classroom settings that are indicative of educational disengagement.	Lower scores
Classroom Avoidance (YRB)	2-item dichotomous scale (frequency)	Youth-report	Checklist of classroom avoidant behaviour that includes wagging school and skipping class, and assessed by the young person as present.	Lower scores
Externalising Problems (YRB)	7-item dichotomous scale (frequency)	Youth-report	Checklist of behaviours directed externally at both teachers and peers, including anger, swearing, work refusal, aggression and bullying, and assessed by the young person as present.	Lower scores
Mental Absence (YRB)	2-item dichotomous scale (frequency)	Youth-report	Checklist of tiredness and daydreaming behaviour exhibited within school and classroom settings, and assessed by the young person as present.	Lower scores
BCQ YRB Motivation to Change (YRB-MTC) Total	4-point categorical scale	Youth-report	The mean measure of a young person's willingness or motivation to change their behaviour when at least one behaviour is present on the total BCQ YRB scale.	Higher scores

^aDesired functioning is only specified for outcome variables applied within the research.

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 7)

Variable Name	Type		Definition	Desired Functioning
Classroom Avoidance (YRB-MTC)	4-point categorical scale	Youth-report	The mean measure of a young person's willingness or motivation to change their behaviour when at least one behaviour is present on the Classroom Avoidance subscale.	Higher scores
Externalising Behaviours (YRB-MTC)	4-point categorical scale	Youth-report	The mean measure of a young person's willingness or motivation to change their behaviour when at least one behaviour is present on the Externalising Behaviours subscale.	Higher scores
Mental Absence (YRB-MTC)	4-point categorical scale	Youth-report	The mean measure of a young person's willingness or motivation to change when at least one behaviour is present on the Mental Absence subscale.	Higher scores
BCQ Teacher Report Problems (TRP) Total	18-item dichotomous scale	Teacher-report	Checklist of 18 behaviours exhibited within school and classroom settings that are indicative of educational disengagement, and assessed as "problems" by observing teachers.	Lower scores
School and classroom Avoidance (TRP)	4-item dichotomous scale	Teacher-report	Checklist of class and school avoidant behaviour, including truancy, refusing to attend class, leaving class early and skipping class, as assessed by a teacher as representing a "problem".	Lower scores
Interpersonal Problems (TRP)	4-item dichotomous scale	Teacher-report	Checklist of interpersonal problems directed to both teachers and peers, including anger, swearing, bullying and conflict, as assessed by a teacher as representing a "problem".	Lower scores
Work Avoidance (TRP)	4-item dichotomous scale	Teacher-report	Checklist of work avoidant behaviour that includes refusing to do work, giving up, not doing homework and not trying, as assessed by a teacher as representing a "problem".	Lower scores
BCQ TRP Motivation to Change (TRP-MTC) Total	18-item dichotomous scale	Teacher-report	A young person's willingness or motivation to change when at least one problem is present on the BCQ TRP Total scale.	Higher scores
School and Classroom Avoidance (TRP-MTC)	4-point categorical scale	Teacher-report	A young person's willingness or motivation to change when at least one problem is present on the BCQ TRP School and Classroom Avoidance subscale.	Higher scores
Interpersonal Problems (TRP-MTC)	4-point categorical scale	Teacher-report	A young person's willingness or motivation to change when at least one problem is present on the BCQ TRP Interpersonal Problems subscale.	Higher scores

Table Z.1

Definitions of Static, Predictor and Dependent Variables (Part 8)

Variable Name	Type		Definition	Desired Functioning
Work Avoidance (TRP-MTC)	4-point categorical scale	Teacher-report	A young person's willingness or motivation to change when at least one problem is present on the BCQ Teacher-Report Work Avoidance subscale.	Higher scores
BCQ - Youth Problem Awareness (YPA)	Composite scale ranging from 0 to 2	Teacher- and youth-report	A measure of a young person's assessment of their behaviours representing a "problem", when the behaviour has been assessed as a problem by an observing teacher.	Higher scores

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