The adaptation of Australian-born children of skilled immigrants

By

Asma Akther

B.Sc. Hons (Psychology), M.Sc. (Clinical Psychology)

Thesis
Submitted to Flinders University
for the degree of Doctor of Philosophy

School of Psychology

College of Education Psychology and Social work

Approved 7th November 2023

Contents

List of Tables

List of Figures

Abbreviations

ESB   English speaking background

K6   Kessler Psychological Distress Scale 6

LSAC   Longitudinal Study of Australian Children

NAPLAN   National Assessment Program for Literacy and Numeracy

NESB   Non-English-speaking background

OECD   Organisation for Economic Co-operation and Development

PISA   Programme for International Student Assessment

SDQ   Strengths and Difficulties Questionnaire

UN   United Nations

Definitions

Datasets

Longitudinal Study of Australian Children

The "Longitudinal Study of Australian Children" (LSAC) is the first nationally representative longitudinal study of child development in Australia. It is a broad, multi-disciplinary study that was developed to examine the impact of Australia's unique social, economic, and cultural environment on the next generation, particularly regarding issues of policy relevance. The study represents a partnership between the Department of Social Services (DSS), the Australian Institute of Family Studies (AIFS), and the Australian Bureau of Statistics (ABS).

National Assessment Program Literacy and Numeracy

The National Assessment Program Literacy and Numeracy (NAPLAN) is a full cohort assessment of students in Years 3, 5, 7, and 9 that tests the development of skills in reading, writing, language conventions (spelling, grammar, and punctuation), and numeracy.

Children's contexts

Children of immigrants.

Children born to immigrant parents, regardless of the country of their birth. As the generic overarching term, this refers collectively and/or discretely to first- or second-generation immigrant children)

First-generation immigrant children.

Children who made the immigration journey to the host country, usually in the company with their immigrant parents

Second-generation immigrant children.

Children born in the host country to the immigrant parents

Parent contexts

English speaking background

English-speaking background (ESB): Countries in which English is typically the population's first language.

Non-English-speaking background

Non-English-speaking background (NESB):Countries in which English is not typically the population's first language.

Skilled background

Either parent (or one parent in sole parent families) has education qualifications to the level of an advanced diploma or higher. Due to Australia's skilled migration scheme, most immigrants are likely to have acquired qualifications from their heritage country. Data for all three groups of children in this thesis related to children of parents with such qualifications deeming them as having a 'skilled' background, whether explicitly stated or not.

Unskilled background

Both parents (or one parent in sole parent families) have education qualifications that are lower than advanced diploma.

Measurements

Kessler Psychological Distress Scale

The Kessler Psychological Distress Scale (K6) (Kessler et al., 2002) is a shortened version of the K10. K6 contains 6 mental health-related questions. Participants use a 5-point scale to rate how frequently, during the last 30 days, they felt sad, nervous, restless, or fidgety, hopeless, or that everything is an effort or worthless. Total scores range from 6 which likely indicating severe mental health disorder to 30 likely no distress.

Strengths and Difficulties Questionnaire

The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) is a behavioural screening questionnaire designed to identify emotional and behavioural problems among 3-16 years old children. This 25 items scale is divided into 5 sub-scales assessing four types of difficulties (emotional symptoms, conduct problems, hyperactivity, and peer relationship problems), and one strength (pro-social behaviour). The total difficulties score is calculated by adding scores for the four difficulties. Higher difficulties scores on SDQ reflect more emotional and behavioural problems.

ABSTRACT

Immigration is a defining characteristic of the 21st century across the world. Successful adaptation among the children of immigrants increases their well-being and contributes to their host countries' economic prosperity and social cohesion. Research in the USA and Europe reports that children of immigrants from most countries have poorer adaptation (e.g., OECD, 2012). However, majority research has predominantly based on pooled samples of first and second-generation children of unskilled immigrants and findings rarely separated according to those parents share the language of the host country against those who do not. Furthermore, a little former research tends to be informed by theory. It is not clear whether these findings are applicable to children born in the host country to skilled immigrant from non-English-speaking backgrounds (NESB) countries. This thesis used the "Immigrant Youth Adaptation in Context" framework (Motti-Stefanidi et al., 2012) as a guide to explore the adaptation of children born in Australia to skilled immigrants from NESB. This thesis comprised five quantitative studies including first longitudinal study on selected children group and an addition of attrition analysis. Study One examined group differences among children of NESB skilled immigrants, children of skilled immigrants from English-speaking background (ESB), and children of native-born skilled parents, in relation to emotional and behavioural problems, and academic achievement in reading and numeracy performance at aged 10, 12, and 14 years. The results showed that children of NESB immigrants were similar to or better than those of children of native-born parents and ESB immigrants for all outcomes at all ages. Study Two focused on longitudinal changes among the same groups on the same outcomes and found that the pace of improvement was also similar to or better for children of NESB immigrants compared to counterparts. Studies 3-5 focused on the theoretical framework assisted identification of predictors to explore individual differences of outcomes of children of NESB immigrants during the transition to high school. In Study Three, hierarchical linear regression analyses showed that predictors in the theoretical model accounted for 40% of the variance of outcomes in emotional and behaviour problems. Children's self-esteem and the quality of their relationship with their teachers were negatively associated, whereas children's reactivity and children experienced bullying victimisation relative to host peers were positively associated with emotional and behavioural problems. Studies Four and Five found that about 31.2% of variance in reading,

and almost 46% of variance in numeracy performance were accounted for by the predictors in the theoretical model. Children's reading performance was positively associated with their Primary caregivers education levels, their own school engagement, matrix reasoning ability, and educational aspirations relative to heritage peers group. Children's numeracy performance was positively associated with children's academic persistence, matrix reasoning ability, and educational aspirations relative to heritage peers. In conclusion, the findings from Studies One and Two have parallels among the children of Asian-American immigrants in the USA. Guided by the theoretical framework, Studies Three, Four, and Five identified specific predictors related to children's characteristics and their developmental context that contributed independent variance to measures of adaptation among children of NESB skilled immigrants. Further research is required to understand contexts of children of skilled immigrants from NESB relative to children of skilled immigrants from ESB.

Keywords: adaptation: emotional and behavioural problems; academic achievement (reading performance and numeracy performance); second-generation immigrant children; skilled immigrant backgrounds; and English and non-English speaking country backgrounds.

DECLARATION

I, Asma Akther, certify that this thesis:

1. does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university

2. and the research within will not be submitted for any other future degree or diploma without the permission of Flinders University; and

3. to the best of my knowledge and belief, does not contain any material previously published or written by another person except where due reference is made in the text.

ACKNOWLEDGEMENTS

At the very beginning, I wish to articulate my profound gratefulness to almighty, whose divine help empowered me with patience and strength to accomplish this thesis. Many people have assisted and encouraged me in the long journey of accomplishing this thesis, either directly or indirectly over the past few years.

First of all, I wish to express my deep gratitude to my first treasured principal supervisor Dr. Julie Robinson, who left due to unforeseen personal circumstances but later returned as adjunct to again support me to the end. I can never thank her enough for her guidance along the way, with enduring patience and diligent encouragement at every step. Her generous guidance, constructive criticisms, and above all friendly affection, even during her tenure as my adjunct supervisor towards achieving my aspiration entirely goes beyond the thanks. Without your support I am doubtful I could complete my thesis

I would like to express my deep gratitude to my treasured current principal supervisor Associate Professor Helen McLaren and associate supervisor Dr. Lorna Hallahan, both who came on board when Dr Robinson became unavailable. They provided valuable supervision, guidance, constructive criticisms, support, patience, unstinting encouragement, generosity, allow freedom of work and above all friendly affection and contribution towards achieving my aspiration and dream. Without your support I am doubt I could complete my thesis. Specially I will never forget the uplifting support at the beginning of my transition into supervision. Helen, I am deeply thankful for your tremendous supports towards completing and submitting my thesis by the due date. I am also appreciative of Dr. Junwen Chen, my other associate supervisor, for her assistance during times when I required it.

I am deeply grateful to the members of my proposal confirmation panel: Associate Professor Tim Windsor, Professor Phillip Slee and Associate Professor Noore Siddiquee for their precious time and substantive input, along with their insightful feedback and remarks regarding the breadth and depth of my thesis. I am also grateful to Professor Rosalyn Shute, and Late Professor Eric Richards for their valuable time and constructive feedback on my thesis proposal.

would listen and continuous boasting my self-esteem with his wise guidance and encouragement. It would not be possible without their unconditional love and thoughtful support in both good and tough time. I am also thankful to be blessed with my parents for their spiritual support, they awoke before dawn each day to pray for me. I never say enough how grateful I am by their love and blessing. I am also grateful to be blessed with my parents-in-law (Md Nurul Islam, late Monwara Begum), who also wanted to show my thesis to everyone who would listen and their support spiritually by remembering me in their blessing in everyday prayers. It is a great sorrow for me that my mother-in-law is no more with us, but her aspirations for me acted as a driving force, offering considerable assistance in the successful completion of this thesis.

Finally, my husband Shahid Ullah, deserves my utmost respect for his love, patience, advice, moral support, and continuous encouragement which was always a source of strength for me throughout these challenging years. I would also like to extend a heartfelt appreciation to both of my beloved sons, Saajid Muhtasim, and Sakeef Wasit, for generously sharing their mum's time for helping me to achieve my goal. Thank you Sakeef for deleting the Facebook app from my mobile and thank you Saajid for pushing me always to go to university and study hard. Without all of your support, I doubt I could have accomplished my work successfully. Although they always encouraged me to attend university and study diligently, I often wished to be at home with them, especially during their school holidays. Your love for life's simplest joys will always hold a special place in my heart.

Asma Akther

STATEMENT OF CO-AUTHORSHIP

The findings from the five studies contained in this thesis, have previously been communicated to the academic community via conference presentations. Significant sections from these pieces of work have been adapted for inclusion in this thesis.

Conference Paper and Poster Presentation

Akther, A., Robinson, J., McLaren, H. & Hallahan, L. (2022). *Undertaking attrition analysis in a longitudinal dataset: Giving strong explanation of your longitudinal findings.* The Higher Degree Research (HDR) conference of College of Education, Psychology and Social Work of Flinders University. Adelaide, Australia, 19 September 2022.

Akther, A., Robinson, J., McLaren, H., & Hallahan, L. (2020). Academic achievement of the children of skilled immigrants from non-English-speaking countries. The 26th Biennial meeting of the International Society of Behavioural Development (ISSBD). Island of Rhodes, Greece, 21-26th June 2020. (Accepted, but because of COVID 19 this conference canceled)

Akther, A., Robinson, J., McLaren, H. & Hallahan, L. (2019). *The adaptation of children of skilled immigrants: An overview of Australian longitudinal data*. The Higher Degree Research (HDR) conference of College of Education, Psychology and Social Work of Flinders University. Adelaide, Australia, 29 November 2019. (Short listed for HDR conference awards).

Akther, A. & Robinson, J. (2018). *Can children of immigrants thrive? Data from Australia*. The 25th Biennial meeting of the International Society of Behavioural Development (ISSBD). Gold Coast, Queensland, 15-19 July 2018

CHAPTER 1 — INTRODUCTION

1.1   Overview

Immigration is a defining characteristic of the 21st century (Castles, 2000, 2005) around the world. International immigration currently reaches far beyond the traditional countries of immigration such as the USA, Europe, and Australia. In 2015, a reporting by the United Nations (UN) showed that 33% of the total world's population were immigrants (UN, 2018). This percentage had increased by a further 3% (36%) in 2020 (UN, 2022) despite the COVID-19 pandemic. Changes in migratory trends have generated opportunities for both immigrants and their host countries. This large scale of immigration, the extent to which the children of immigrants achieve successful adaptation will have a considerable influence on host countries economic prosperity and social cohesion, alongside benefits to children's well-being (Motti-Stefanidi et al., 2012). Children of immigrants face challenges across diverse domains of their adaptation, including acculturation, academic achievement, and psychosocial well-being.

Two groups of children are predominantly affected by the challenges of adaptation associated with immigration: children who born outside the host country and have made the immigration journey with their parents (first-generation immigrant children) and children born in the host country to immigrant parents (second-generation immigrant children). Both of these groups face three types of adaptation challenges in the host country: challenges common to their developmental stage (e.g., puberty) (Blakemore et al., 2010); challenges that may be more prevalent or more salient for children affected by immigration (e.g., intergenerational conflict) (Motti-Stefanidi et al., 2011); and challenges specific to their family's immigration status (e.g., parents with limited proficiency in the host language) (Schuller, 2015; Toppelberg & Collins, 2010). In the short term, the challenges faced by children affected by immigration may influence diverse domains of their development, including psychosocial functioning (Sirin et al., 2013; Motti-Stefanidi et al., 2010); sense of belonging (Motti-Stefanidi et al., 2010); and academic achievement (Suárez-Orozco et al., 2010; Rudasill et al., 2009). In the long term, these challenges can influence the economic contribution to the host country (Fuligni, 1998) and the cohesiveness of the host community (Hickman et al., 2008).

Currently, the adaptation of children affected by immigration is a focus of developmental research. However, current research has three limitations. First, most research focused on unskilled immigrants, and it is unknown whether the results can be generalised to the children of skilled immigrants. Second, research is predominantly based on pooled samples of first and second-generation immigrant children. This obscures our understanding of the distinct challenges and outcomes of these two groups. Third, little recent research is informed by a theoretical framework. To address these gaps in our understanding, this thesis compared the outcomes of two groups of second-generation children of skilled immigrant parents, from English speaking and non-English speaking backgrounds, with children of Australian native-born skilled parents. In addition, this thesis was guided by a theoretical framework specifically designed for research on children of immigrants, "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012).

1.2   Domains of adaptation

Children's adaptation involves their completion of age-appropriate developmental tasks according to their culture (Havinghurst, 1948, 1974; Neugarten et al., 1965). Children from diverse cultures differ in both developmental tasks and the ages at which they are expected to master these tasks. Domains of children's adaptation have been classified as predominantly internal or predominantly external in all cultures. A predominantly internal domain includes the psycho-social wellbeing and the life satisfaction, whereas predominantly external domain includes the age-appropriate tasks for school-age children, such as, academic achievement and acceptance by peers.

As children's internal adaptation includes their sense of well-being, it pertains to the psychological and emotional aspects of a child's response to different circumstances or adversity. It involves how children develop cognitive, emotional, and social skills that allow them to understand, cope with, and make sense of the world around them. Children gradually learn to manage their emotions, handle stress, and regulate their reactions to various stimuli. In this circumstance, it holds significance for maintaining their psychosocial well-being. Thus, an important marker of positive internal adaptation among children is psychosocial well-being as opposed to distress (Masten, 2006). One developmental task of childhood is to develop their coping strategies that allow children to maintain their

psychosocial well-being in stressful contexts. Accordingly, this thesis used the level of successful adaptation on children's emotional and behavioural problems as a marker of their internal adaptation.

Children's external adaptation refers to how children adjust to the external environment, and how well they can complete developmental tasks relating to school, family members, cultural contexts, societal expectations, peers, and members of the wider community. Markers of children external adaptation include whether they display rule-abiding behaviour, the extent to which they can develop friendships, and their ability to acquire the knowledge and cognitive skills needed for economic independence in adulthood (Masten, 2006; McCormick et al., 2011). Academic achievement is one of the core developmental tasks of school-age children in most contemporary societies regardless of their immigrant status or socioeconomic status. This thesis focuses on children's academic achievement in two core areas, reading and numeracy, as a marker of their external adaptation. Adopting these two outcomes is particularly relevant in research on adaptation among the children of immigrants.

In summary, children's adaptation encompasses both internal processes and external factors. A healthy balance between these aspects helps children grow into resilient, capable, and well-adjusted individuals who can successfully navigate various life challenges and adapt successfully.

1.2.1   Challenges to the adaptation of children of immigrants

Children of immigrants face several sources of challenges to both their internal and external domains of adaptation. Most of these challenges are common to both first- and second-generation immigrant children, and to children whose parents have high or low employment skills. Children of immigrants face the normative developmental challenges experienced by their age group and gender (Masten, 2006). While these challenges are also experienced by the children of native-born parents, children of immigrants often face a greater number of challenges than children of native-born parents. This is primarily because they have limited access to coping resources for managing their challenges. For instance, the children of immigrants experience a lack of assistance from their extended family.

Furthermore, the children of immigrants face acculturative challenges (Phinney et al., 2011). Acculturation refers to the process of cultural and psychological change that follows intercultural contact (Berry, 2002). The cultural changes include alterations to an individual's customs and economic and political life. The psychological changes include alterations in individuals' attitudes toward the acculturation process, their cultural identities (Phinney, 2003), and their social behaviour. Successful acculturation often involves being able to "live in two worlds". For example, children's involvement in the host culture is a leading predictor of their school adjustment, while their continued involvement in their heritage culture is positively associated with their subjective well-being. The positive correlation between poor acculturation and poor mental health outcomes in children is well established in current literature (Bowe, 2020; Duinhof, et al., 2020; Sirin et al., 2019; Balidemaj & Small, 2018).

There is a substantial variation of acculturation challenges experienced by first- and second-generation immigrant children. For example, second generation children have been emersed in the culture and language of the host country from an early age, while first-generation immigrant children have not had the same exposure. It is possible that the greater material and cultural capital held by skilled immigrant parents may allow them to buffer their children against some acculturation stressors in ways that may not be available to unskilled immigrant parents. This may also be the case for immigrant parents fluency in the language of the host country.

1.2.2   Levels of adaptation among children of immigrants

Internal adaptation

The relationship between the stress experienced by immigrants and their emotional well-being is bidirectional. The stressors immigrants' families experience in their host country can affect the psychological well-being of both parents and their children. The emotional health of immigrants also affects their experience of stressors, both directly and indirectly, for example, by hampering parents' capacities to nurture their children's socio-emotional development (Petterson, & Albers, 2001).

Several studies have shown that the psychosocial well-being of immigrant children is poorer than that of their native-born peers (e.g., Alonso-Fernández et al., 2017). For internal

adaptation, this is evidenced, for example, in higher levels of physical fighting and bullying, and lower life satisfaction among children of immigrants (Fandrem, et al., 2009; Motti-Stefanidi et al., 2008; Oppedal, & Røysamb, 2004; Stevens, et al., 2015; Virta, et al., 2004), and an elevated risk of a diagnosis of emotional and behavioural problems during adolescence (Motti-Stefanidi et al., 2008; Oppedal & Røysamb, 2004).

External adaptation

Educational environment is one of the key areas of requiring external adaptation for children. Their level of adaptation is reflected in their school engagement and academic performance. Immigrant status is an established risk factor for school performance (Motti-Stefanidi et al., 2008; Motti-Stefanidi, 2014; Motti-Stefanidi et al., 2015; Anagnostaki et al., 2016; Suárez-Orozco et al., 2010), means that being an immigrant, or having immigrant parents, has been recognised as a factor that can negatively influence how well a student performs in school. Many studies found that children of immigrants were at a substantial academic disadvantage compared to children of native-born parents (Dustmann et al., 2012; Motti-Stefanidi et al., 2008; Motti-Stefanidi et al., 2015; Thomas, 2009; Schnell & Azzolini, 2015). Moreover, some research showed that highly acculturated second-generation immigrant children have poorer outcomes than first-generation immigrant children) (e.g., Marks et al., 2014).

In addition, the majority of current studies investigating the level of adaptation achieved by immigrant children was primarily cantered on first-generation immigrant children or on mixed samples of first- and second-generation immigrant children. The few studies that have focused on second-generation children use inconsistent definitions of this group and/or do not attempt to recruit a nationally representative sample. Research highlighting disadvantage patterns were undertaken in the USA and Europe, focusing on the children of immigrants who were unskilled workers. It is unclear whether these findings can be generalized to immigration contexts in which most immigrants have high levels of employment skills. This study addresses this gap by focusing on children born to skilled immigrant parents after their arrival in the host country and seeking to recruit a representative sample of these children.

1.2.3 Predictors of adaptation among the children of immigrants

In addition to examining the level of adaptation achieved by the children of immigrants, the current thesis aimed to identify the factors that contribute to individual differences in their level of adaptation. Previous research identified a range of predictors of such individual differences on both macro and micro scales. On a macro scale, Level et al. (2008) identified three factors that influence the academic achievement of children of immigrants: the heritage country context, the host country context, and the host country's immigration policy. Many studies have shown the influence of the heritage country context. For example, Dronkers, and Kraaykamp (2008) found that children from Indian backgrounds performed better than the national average wherever they had settled (such as in Australia, New Zealand, and Scotland); whereas children from Pakistani backgrounds always performed worse than the national average wherever they had settled (such as in Denmark, Scotland). Differences can also be discerned between immigrant populations in the same host nation. For example, Liu and Xie (2016) showed that in the Asian immigrants outperform their peers who immigrated from other world regions. There is ample evidence of the importance of the host country context. For example, literature (Entorf & Minoiu, 2005) showed that children who have immigrated to Australia, Canada, and New Zealand have higher performance in the Program for International Student Assessment (PISA) tests than children who have immigrated to countries such as Germany, France, and the USA. Dustmann et al. (2012) found a substantial variation in the academic achievement of the children of immigrants across countries. Marks et al. (2018) showed that multicultural policies, and positive integration approaches had strong linkages with immigrant children's adaptation and overall child well-being. Level et al. (2008) suggests that enhanced educational achievements among immigrant children in specific host nations can be attributed to more stringent immigration regulations.

On a micro scale, internal and external factors contribute to the extent of adaptation shown by the children of immigrants. Adaptation is supported by positive internal ("assets") and external factors ("resources") and limited by negative internal ("vulnerabilities") and external factors ("risk factors") (Table 1.1). Some factors were relevant to all or most children (normative) while others were particularly relevant to the children of immigrants (acculturative).

Table 1.1: Examples of factors that contribute to the adaptation of any children of immigrants

Domains of factors	Types of factors	Examples	
		Normative	Acculturative
Internal Characteristics of child	Positive 1. (Assets)	High educational expectations; high school engagement persistence in academic tasks Non-verbal intelligence Empathy Self-esteem	Bilingual Pride in cultural heritage
	Negative (Vulnerabilities)	Low sense of belonging. Child's Reactivity/irritable temperament.	Confused sense of identity. Illness
External Characteristics faced and contents in the child's environment	Positive (Resource factors)	Mother's educational expectation for the child High parental education High educational expectations of peers in host group Positive parent-child relationships Involvements in extracurricular activities (sports, music) Positive teacher-child relationship.	Involvement with a heritage community organisation (e.g., heritage language school) High educational expectations of peers in the heritage group Parents' proficiency in the host language
	Negative (Risks factors)	Peer victimisation for reasons other than ethnicity, culture, or religion. Poor parental mental health Intergenerational conflict	Victim of bullying by heritage peer group Discrimination

1.3   Theoretical framework

Most empirical research on the adaptation among children of immigrants was conducted without being guided by any theoretical framework, despite the development of a theoretical framework specifically designed for this population.

Three theoretical frameworks have been widely cited in research concerning adaptation among children of immigrants. Berry's (1997) Acculturation Framework was used in research on both adults and children but is not a good match for this thesis. Originally developed to explain adult acculturation, it did not focus on children of immigrants or differences between skilled and unskilled immigrants. Hobfoll's (1998, 2001) *Conservation of Resources* framework focused on humans' motivation to protect their current resources and acquire new resources to maintain adaptation. This was not selected for inclusion in this thesis because even though it has been applied to the study of children of immigrants, the focus has been primarily on those with refugee backgrounds. Conversely, the "Immigrant Youth Adaptation in Context" framework by Motti-Stefanidi et al. (2012) focused specifically on children of immigrants, making it a suitable fit for the scope of this thesis. Therefore, the current thesis addressed this gap by applying this "The Immigrant Youth Adaptation in Context" framework (Motti-Stefanidi et al., 2012). This framework was informed by the three-level model of immigrant adaptation used by Verkuyten (2005); the bioecological model of human development (Bronfenbrenner & Morris, 2006); Berry's cultural transmission model (Berry et al., 2011); and the risk and resilience framework (Garmezy et al., 2007).

Data used in the development of Motti-Stefanidi's framework was based on pooled samples of first- and second-generation immigrant children in Greece. The vast majority of parents had migrated from two countries: namely Albania and Turkey. with a significant portion of them being unskilled workers (Motti-Stefanidi et al., 2012). The extent to which the framework applies to second-generation immigrant children to countries with a selective immigration policy is therefore unclear. To acknowledging this gap, this thesis examines whether this framework applies to the second-generation immigrant children from skilled immigrant backgrounds. The original "Immigrant Youth Adaptation in Context"

31

framework developed by Motti-Stefanidi et al. (2012) is presented in the following figure (Figure 1.1).

Figure 1.1: Immigrant Youth Adaptation in Contexts: An integrative framework (Motti-Stefanidi et al., 2012)

"Removed due to copyright restriction"

This integrative framework identifies predictors at three levels: the societal level, the interaction level, and the level of individual (Motti-Stefanidi et al., 2012). All three levels were embedded and interconnected within each other. All of these three levels play a central role in the positive immigrant youth adaptation. One individual level could not claim as sole agent of individual differences of immigrant youth adaptation. The societal level predictors such as societal representation and ideologies and cultural beliefs contributed to the adaptation of children of immigrants (e.g., Jasinskaja-Lahti & Liebkind, 2007). The level of interaction refers to the many situations where children of immigrant continuously interact with other people every day (Verkuyten, 2005). It was then elaborated to include the contexts of interaction considered by developmental (Bronfenbrenner & Morris, 2006) and acculturation psychologist (Berry et al., 2011; Oppedal, 2006; Sam, 2006) as central for the development and acculturation of children of immigrant. The individual level refers to children of immigrants intraindividual characteristics (e.g., self-esteem, nonverbal-intelligence, temperament, motivation, self-regulation, and personality). In the framework the interaction level was consider to societal contexts which serve the purpose of both development and acculturation context in the child's immediate environment. Societal level factors, such as laws, cultural norms, economic conditions, and government policies influence both children's home culture contexts and the dominant (host) cultural context. These two cultural contexts influence three areas in which children have interactions with their home culture group, their parents and wider family, and school. Strong social predictors (e.g., social class and ethnicity or heritage backgrounds, discrimination, segregation, and prejudice) contribute the unique adaptation of children of immigrant (Garcia-Coll et al., 1996). For children of immigrants, two agents in these areas are of particular importance such as peers from their heritage cultural group and peers from the host cultural group. The effect exerted by these predictors on children's adaptation is mediated by child characteristics. As a result, this framework highlights the multiple determinants of individual differences in adaptation among children of immigrants.

This thesis broadens the previous applications of the "Immigrant Youth Adaptation in Context" framework (Motti-Stefanidi et al., 2012) by adapting it for research on adaptation among the children of immigrants born in the host country to skilled immigrant parents. A comparative representation of the original framework and the revised adapted version used

in this thesis is depicted side by side in Appendix (*see Appendix I for emotional and behavioural problems, and Appendix II for academic achievement in reading and numeracy performance)*. It was slightly modified because of the unavailability of predictors according to each section or level, as the archival dataset was used for this research.

1.4   Context of immigration to Australia

Australia provides a useful context in which to study the level of adaptation achieved by the children of skilled immigrants and the factors that contribute to individual differences in adaptation. Australia has a rich immigration history. Over the last five decades, Australia has welcomed immigrants through three streams: family reunification, skilled migration, and humanitarian entrants. Notably, the skilled immigration category constitutes the largest stream. Collectively, these three streams have contributed to a large and increasing population of immigrants. On 30 June 2020, 30% (7.6 million people) (Australian Bureau of Statistics, 2019-20) of the estimated resident Australian population was migrants compared to 25.7% (5.5 million people) in June 2008 (Australian Bureau of Statistics, 2007-08).

The present immigration policy clearly aims to attract immigrants possessing employment skills that can make the most substantial contribution to the economic progress of both the Australian economy and community. Applicants to the skilled migration stream are selected based on their nominated occupation, age, skills, qualifications, English language ability, and perceived employability. Skilled immigrants are required to have completed at least an advanced diploma and have professional skills and fluency in the English language. Such immigrants are favoured because they are perceived to have a high capacity to cope with a new culture and environment. Therefore, it is plausible that the children of skilled immigrants to Australia may show better internal and external adaptation than those reported in previous research from other countries on the children of unskilled immigrants.

The choices of highly skilled workers' to immigrate may be influenced by both pull factors (e.g., educational opportunities, improved quality of life, greater political freedom) and push factors (e.g., political, or economic instability or discrimination in their home country). Nonetheless, upon arrival, numerous skilled immigrants encounter challenges in

securing employment that matches their qualifications. Despite holding university degrees in medicine, engineering, or in other highly regarded professional qualifications, many of these immigrants in Australia end up working in roles like driving taxis, and jobs within hospitality, child services, and age care (Gowen, 2023; Huggins & Dimopoulos, 2023). This situation can contribute to additional sources of stress.

Immigrants' experiences in Australia are shaped by its selective migration policy, multicultural policies, and strong settlement support (e.g., New Arrivals Program for school students; English Language programs for adult immigrants; Migrant Resource Centres) (Papadoploous, & Viegas, 2017). This unique context might lead to higher level of adaptation among children of immigrants in Australia compared to those in the host nations that have made the greatest contribution to previous research (i.e., Western Europe and the USA). Earlier studies suggest that specific trends in outcomes could exist within nations that implement multicultural policies and embrace positive integration strategies (Friberg, 2019; Marks et al., 2018), as well as in countries that adopt selective immigration practices (e.g., Entof, & Minoiu, 2005, Friberg, 2019).

Sam (2017, p.504). refers a concept about multiculturalism, "a policy and its attending practices regarding the coexistence of many ethnocultural groups in a plural society, as well as the normative beliefs that characterize how the relationships should be among the groups". In general, The Australian multiculturalism policy and governance form a framework designed to foster cultural diversity, social inclusion, and the fair treatment of individuals from various cultural backgrounds within Australian society. It is based on the acknowledgment and acceptance of the nation's diverse cultural and ethnic landscape. The policy aims to celebrate and preserve the cultures, languages, and traditions of all ethnic groups within the nation. It focuses on social cohesion, respect for cultural diversity, equality, increase sense of belonging, and the elimination of discrimination. The objective is not assimilation but rather the coexistence and mutual respect of diverse cultures while promoting a shared national identity. Australian governance implements various programs and initiatives to support immigrant communities and enhance their positive adaptation. These initiatives include language support services, cultural festivals, community events, settlement services, employment assistance, and educational programs designed to accelerate immigrants in integrating into Australian society. The policy aims to create an

inclusive society where immigrants are encouraged to participate fully in all aspects of Australian life. The government works to ensure equal opportunities in education, employment, and social engagement, promoting the active involvement of immigrants in civic and community activities. Overall, this policy and governance structures play a significant role in the adaptation of immigrants and their children. They provide a supportive environment that allows immigrants to retain their cultural identities while facilitating their integration into the broader Australian community. This approach encourages a sense of belonging and reduces the challenges of cultural adaptation. Multicultural policies are often integrated into educational national curriculum, promoting cultural awareness, and understanding among the children of immigrants. This helps foster a more inclusive society where diversity is celebrated and respected.

In fact, prior research cantered on the children of immigrants in Australia confirms this notion. For example, international tests results in every country in Western Europe and the USA showed that 15-year-old immigrant children had poorer performance in Mathematics, Science, and Reading than their peers with native-born parents (OECD, 2012). In contrast, in Australia, the children of immigrants performed better than their peers with native-born parents (Akther & Robinson, 2014). Similar findings have reported in other Australian studies (Cobb-Clark et al., 2012; Islam et al., 2022; Washbrook et al., 2012). For example, Islam et al. (2022) found that children of immigrants exhibited better performance than children of native-born parents in Australia's National Assessment Program-Literacy and Numeracy (NAPLAN). However, such findings (e.g., Islam et al., 2022) are based on a mixed sample of the children of skilled and unskilled parents, and of first- and second-generation immigrant children. It is currently unclear whether the findings apply specifically to the second-generation children of skilled immigrants. It is also unclear whether the findings apply equally to the children of skilled immigrants from English-speaking (e.g., United Kingdom, New Zealand) and non-English-speaking countries (e.g., Vietnam, Turkey). This thesis addresses this gap in knowledge by comparing the adaptation of children of skilled immigrants from non-English-speaking countries with both the children of skilled immigrants from English-speaking countries, and the children of skilled native-born parents.

1.5 Choice of predictor variables for children of immigrants from non-English speaking countries

Previous research guided the selection of predictors for emotional and behavioural problems and academic achievement at the interaction and child levels of Motti-Stefanidi et al.'s (2012) "Immigrant Youth Adaptation in Context" framework. The framework suggests that the influence of factors at the societal level have their influence on adaptation through their influence on factors at the interaction and individual child levels.

1.5.1 Selecting predictors of emotional and behavioural problems

The interaction level of the framework encompasses both familial and extra-familial contexts. Several characteristics of the homes and families of children of immigrants were associated with their mental health or emotional and behavioural problems (e.g., Lara-Cinisomo et al., 2013; Vaage et al., 2011). Factors that were negatively associated with these problems include mothers' regulation of their own psychological health (Daga et al., 2015), observed family reframing and family problem-solving (Santiago et al., 2020), and family integrity and more traditional family values (Cervantes et al., 2013). The current thesis focused on the primary caregiver's mental health.

Contexts outside the home have also been shown to influence the mental health and emotional and behaviour problems of the children of immigrants. For example, Roorda and Koomen, (2020) found that positive teacher-child relationships were negatively associated with children's emotional and behavioural problems. Peer groups also play an important part in children's adaptation. Positive peer- relationships in both the host and heritage groups support the emotional well-being of children of immigrants (Motti-Stefanidi et al., 2020; Teja & Schonert-Reichl, 2013). However, previous research indicates that children of immigrants often experience a higher level of peer victimisation, including racist, physical, and sexual victimization, than their native-born peers (e.g., Stevens et al., 2015; Strohmeier et al., 2011). Low immigrant density in a school is associated with an increased chance of being bullied (Hjern et al., 2013). Discrimination is also a predictor of emotional and behavioural problems of children of immigrants (e.g., Guerra et al., 2019; Marks et al., 2018). Discrimination refers to the negative reaction according to distinct cultures, skin colour, religion, language, disability, and so on. Immigrant children have an elevated risk of

being discriminated against (Musso et al., 2015), and their perception of discrimination is associated with poor mental health, alcohol abuse and aggression (Nakash et al., 2012; Walsh et al., 2014; Walsh et al., 2018). For extra-familial predictors at the interaction level of the framework, this thesis focused on positive teacher-child relations, perceived discrimination, and peer victimisation.

Several child characteristics have also been identified as predictors children's psychological well-being. The child characteristics positively associated with psychological well-being among children from immigrant backgrounds include self-efficacy (Motti-Stefanidi et al., 2012), self-esteem (Nakash et al., 2012; Neto et al., 2010), and attitudinal familism (Li, 2014). Child characteristics exhibit a negative association with psychological well-being among children from immigrant backgrounds include female gender (Nakash et al., 2012). The current thesis will focus on their self-esteem and reactivity (irritable temperament).

Existing research was mostly reported on emotional and behavioural problems of children of immigrants in the USA and Europe and were based on first-generation children or pooled samples of first- and second-generation children of unskilled immigrants. Consequently, it is hard to generalise the challenges and outcomes of second-generation NESB skilled immigrants. Considering all those predictors derived from previous research and Motti-Stefanidi's framework, this thesis identified and summarizes the variables that were included in the current application of the "Immigrant Youth Adaptation in Context" framework to emotional and behavioural problems experienced by children of skilled immigrants in Figure 1.2. Predictors related *emotional and behavioural problems* of children of NESB immigrants' heritage contexts and ethnic peers included under heritage contexts in adapted framework, because of unavailability of predictors for each level in the datasets. Similar strategy was followed for host contexts and host peer related predictors.

Figure 1-2: Research model showing interaction and individual-level predictors of individual differences in emotional and behavioural problems among children of skilled immigrants (inspired by Motti-Stefanidi et al., 2012)
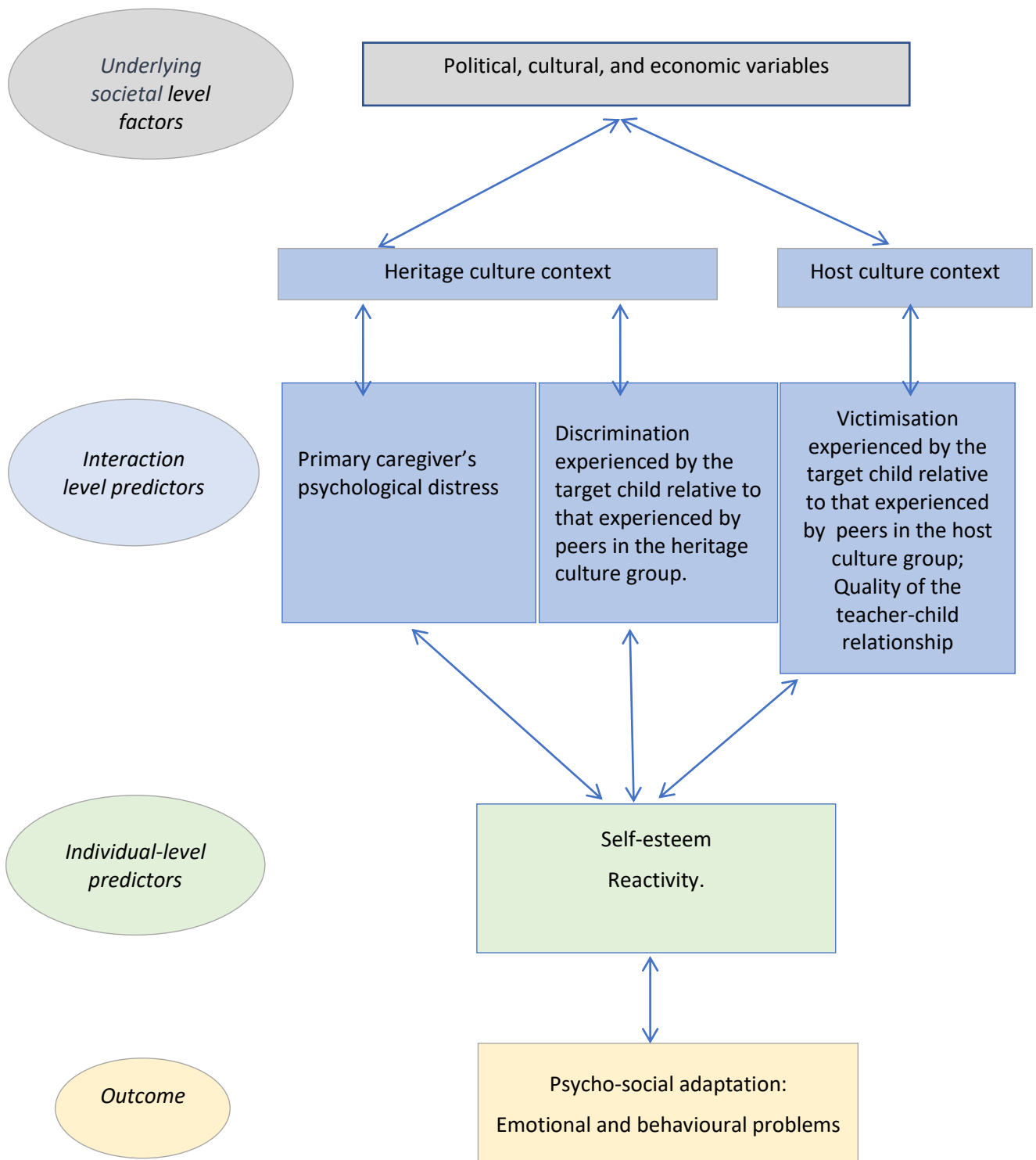
1.5.2 Selecting predictors of academic achievement in reading and numeracy performance

Both familial and extra-familial contexts represent the interaction level of the selected framework. Previous research demonstrated home and family factors related to academic performance, for example, children of immigrant parents who have better host language proficiency outperform native-born children (Casey & Dustmann, 2008; OECD, 2006; Schnepf, 2007; Washbrook et al., 2012). Family resources or family related predictors play a prominent role in children's academic achievement, indicating that immigrant children are not different in this context. For example, family resources promote the academic achievement of children of immigrants (Motti-Stefanidi et al., 2012; Motti-Stefanidi, 2014; Anagnostaki et al., 2016). Such as parents' educational level and their educational expectations of their children are strongly related to their children's academic achievement. Immigrant parents showed high educational expectations for their children (Koustourakis et al., 2016; LSAC, 2014). Their elevated levels of education expectations were positively associated with their children's educational expectations (LSAC, 2014). This thesis would focus on parents' education level, and mother's interest in education.

Outside home contexts also have displayed influences on academic skills in reading and numeracy performances of children of immigrants. Motti-Stefanidi's frameworks suggest that the educational aspirations of children's heritage and host peer-group, along with their significant connections with peers (Asendorpf & Motti-Stefanidi, 2017), as well as their interactions with teachers, have a positive association with their academic achievement (e.g., Özdemir & Stattin, 2014; Motti-Stefanidi et al., 2012). Ly and colleagues (2012) discovered that a positive correlation existed between the strength of the child-teacher relationship and the academic achievements of immigrant children. According to Level et al. (2008) in familiar immigrant-receiving countries with strict immigration laws explain immigrant children's better educational performance. The selective migration policies, this could be generalised to the skilled immigrants and compared to the unskilled immigrants. For extra-familial predictors at the interaction level of the framework, this thesis focused on positive teacher-child relations, and child education expectation relative to heritage peers group,

Child characteristics are highly associated with reading and numeracy performances of children of immigrants. Studies also indicated that unique attributes of immigrant children were associated with their adaptation to academic achievements (Motti-Stefanidi et al., 2012; Motti-Stefanidi, 2014 Anagnostaki et al., 2016; Motti-Stefanidi, 2015) such as their educational expectations and non-verbal intelligence level (LSAC, 2014). The academic achievements of children of immigrants were positively influenced by their elevated aspirations for higher education (Hao & Bonstead-Bruns, 1998). The findings showed comparable results in both reading and numeracy achievements (LSAC, 2014). Children of immigrants' higher-level self-esteem led to disregard negative feedback regarding their academic skills (Lew & Harklau, 2018). High self-efficacy and persistence also associated with academic achievement and children high school completion (Solberg et al., 2007). The lower level of school engagement among immigrant children might result in comparatively lower academic accomplishments in comparison to children born to native parents (Motti-Stefanidi et al., 2015). For individual-level predictors, this thesis would focus on child's self-esteem, school engagement, persistent in academic task and child's non-verbal intelligent.

Existing literature has primarily focused on the academic achievements of first-generation children or pooled samples of first- and second-generation children of unskilled immigrants. In this circumstance, it is hard to generalise the challenges and outcomes of second-generation NESB skilled immigrants. The majority of studies are also cantered around the USA and Western European regions. Considering all those predictors derived from previous research and Motti-Stefanidi's framework, this thesis identified the following predictors (Figure 1.3) to examine the academic achievements in both reading and numeracy performance of children of NESB skilled immigrants.

Figure 1-3: Research model showing interaction and individual-level predictors of individual differences in reading and numeracy skills among children of skilled immigrants (inspired by Motti-Stefanidi et al., 2012)

Underlying societal level factors

Political, cultural, and economic variables

Heritage culture context

Host culture context

Interaction level predictors

Primary caregiver's education level

Mother's interest in education

Educational aspirations relative to those of peers in their heritage group

Quality of the teacher-child relationship

Individual-level predictors

Self-esteem
School engagement
Persistence in academic tasks
Non-verbal intelligence

Outcome

Adaptation: Academic achievement in reading and numeracy performance
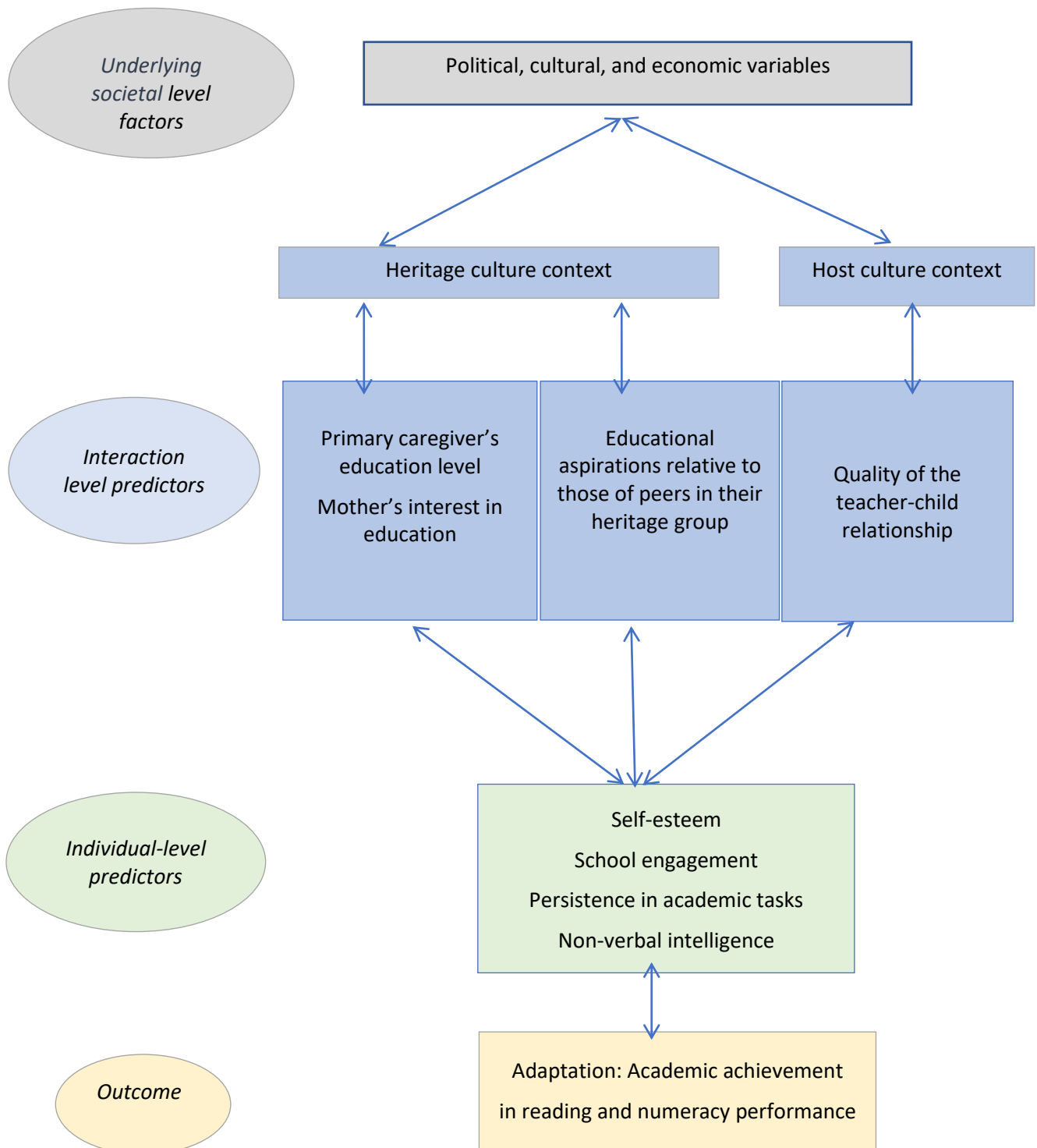
1.6 Summary

In conclusion, there several gaps exist in current understanding of adaptation among the children of immigrants. Most existing research showed that children of immigrants have poorer academic achievement and emotional and behavioural health than children of native-born parents (e.g., Organisation for Economic Co-operation and Development, 2012; Motti-Stefanidi et al., 2011; Motti-Stefanidi et al., 2008). These studies utilise pooled samples of children of skilled and unskilled immigrants with various levels of experience with the host culture; children of immigrants who accompanied their parents to the host country and children of immigrants who were born in the host country to immigrant parents and children mainly from unskilled immigrant backgrounds. Therefore, adaptation of second-generation children from skilled immigrant backgrounds is still unknown.

A significant number of immigrants worldwide possess advanced skills and are employable. In certain nations like Australia, New Zealand, Canada, and Singapore, these individuals make up the predominant portion of those immigrant population. Most previous research focused either on the adaptation of children of parents with low levels of employment skills or on pooled samples of skilled and unskilled immigrants (e.g., Organization for Economic Co-operation and Development, 2013; Sirin et al., 2013; Motti-Stefanidi et al., 2010; Suárez-Orozco et al., 2010; Rudasill et al., 2009; Fuligni, 1998). There is limited research having compared children of immigrants whose parents share the language of the host country against those who do not. Language differences effect on children's access to social capital and this may lead to differences in their socio-emotional or educational development. Children whose parents share the same language of the host country may be advantaged by lower acculturation demands (Casey and Dustmann, 2008; Schmepf, 2007; Washbrook et al., 2012), while children with a heritage language may enjoy the benefits of bilingualism but could be disadvantaged for higher acculturation demands. It is not clear whether the findings from these pooled samples, used in previous research, apply to subsamples of children of first- or second-generation immigrant children, or skilled or unskilled immigrants, or English or non-English language background.

In addition, previous research is rarely guided by a theoretical framework. The current thesis responds to these gaps by exploring the adaptation of second-generation

children of skilled parents from those parents share the language of the host country against those who do not. It uses insights from a framework specifically designed for research on children of immigrants, known as the "Immigrant Youth Adaptation in Context" Motti-Stefanidi et al. (2012).

1.7 Research aims and hypotheses

To address the gap, the overall objectives of this thesis were to explore the level of adaptation among children born in the host country to skilled immigrants who do and do not have the host country's language as their first language, and the insights that the theoretical framework provides into the predictors that influence the adaptation and individual variances of second-generation children of skilled immigrants in Australia. Quantitative research methodology was used. Three groups of children were selected for this research: second-generation children of skilled immigrants from non-English-speaking background (NESB) countries, second-generation children of skilled immigrants from English-speaking background (ESB) countries, and children from native-born skilled parents. Both immigrant children groups were from second-generation backgrounds. Due to this, it's not necessary to consistently mention "second-generation immigrant children." Additionally, all three groups have parents with skilled backgrounds, eliminating the need to repeat the term "skilled" with each group. Subsequently, this thesis examined the second-generation children from NESB skilled immigrants' internal and external adaptation levels and related predictors to explain their independent variances on adaptation in Australia through five quantitative studies.

Comprising a series of five quantitative studies, the first study adopts a cross-sectional research approach to explore group differences of adaptation levels on emotional and behavioural problems and academic achievement in reading and numeracy performance among children of NESB skilled immigrants compared to children of ESB skilled immigrants and children of native-born skilled parents at 10 years, 12 years, and 14 years of age (Study One, Chapter 4). This cross-sectional study identified the group differences in all three outcomes across all three ages. This assessment was conducted in parallel with the examination of the influence of immigrant status and language status effect on the observed levels of adaptation. In the subsequent study, a longitudinal procedure was

employed to examine the longitudinal changes or trajectories on all outcomes of children of NESB skilled immigrants and compared to children of skilled immigrants from ESB and children of native-born skilled parents from the age span of 10 years to 12 years, and 14 years (Study Two, Chapter 5).

Studies Three, Four, and Five focused on children of NESB immigrants during the transition to high school at 12 years of age only. This developmentally transitional age group was chosen due to pre-adolescence to adolescence characterised by many changes in children's lives, e.g., physical hormonal changes (puberty), a transition from primary school to secondary school, development of self-identity, friendship, or peer networks, etc. The theoretical framework and previous research assisted in the identification of predictors of individual variances in emotional and behavioural problems (Study Three, Chapter 6); academic achievement in reading performance (Study Four, Chapter 7), and academic achievement in numeracy performance (Study Five, Chapter 8). These three studies also followed quantitative research method to explore children's individual variances in all three outcomes.

In summary, this thesis investigation implemented a multi-study approach to comprehensively investigate the adaptive levels and longitudinal trajectories of children born in Australia to NESB skilled immigrants. It was not only considered their emotional and behavioural well-being but also evaluates their academic achievement in the areas of reading and numeracy performances. Through a systematic exploration of predictive factors within distinct contexts using the framework "Immigrant Youth Adaptation in Context" Motti-Stefanidi et al. (2012), this research strives to enhance understanding of the dynamics influencing the adaptation experiences of this particular second-generation children from NESB and skilled immigrants backgrounds in Australia. The aim and hypotheses of all five studies are outlined and discussed below.

1.7.1   Study One

Aims

Children groups differences and parent immigrant status and home language effect among second-generation children of skilled immigrants from NESB compared to second-

generation children of skilled immigrants from ESB and children of native-born skilled parents.

Aim – I: To compare the children groups' differences in the level of emotional and behavioural problems and academic achievements in reading and numeracy skills among second-generation children of NESB skilled immigrants; second-generation children of ESB skilled immigrants and children of native-born skilled parents at 10, 12, and 14 years of age.

Aim – II: To compare the level of emotional and behavioural problems across the effect of parents' immigrant status and home language between second-generation children of both NESB skilled and ESB skilled immigrants and the children of native-born skilled parents at 10, 12, and 14 years of age.

Aim – III: To compare the level of academic achievements in reading across the effect of parents' immigrant status and home language between second-generation children of both NESB skilled and ESB skilled immigrants and the children of native-born skilled parents at 10, 12, and 14 years of age.

Aim – IV: To compare the level of academic achievements in numeracy across the effect of parents' immigrant status and home language between second-generation children of both NESB skilled and ESB skilled immigrants and the children of native-born skilled parents at 10, 12, and 14 years of age.

Hypothesis
Group differences
Psycho-social wellbeing: The level of emotional and behavioural problems among second-generation children of skilled immigrants from NESB would be lower compared to children of native-born skilled parents and children of ESB skilled immigrants.

Academic achievement: The level of reading and numeracy performance among second-generation children of skilled immigrants from NESB would be higher compared to children of native-born skilled parents and children of ESB skilled immigrants.

Immigrant effect

Psycho-social wellbeing: The level of emotional and behavioural problems among second-generation children of skilled immigrants from NESB and ESB will be lower compared to children of native-born skilled parents.

Academic achievement: Reading and numeracy skills among second-generation children of skilled immigrants from NESB and ESB will be higher compared to children of native-born skilled parents.

Language effect

Psycho-social wellbeing: The level of emotional and behavioural problems among second-generation children of skilled immigrants from NESB will be higher compared to skilled immigrants from ESB.

Academic achievement: Reading and numeracy skills among second-generation children of skilled immigrants from NESB will be higher compared to children of skilled immigrants from ESB.

1.7.2   Study Two

Aim – I: To explore the longitudinal changes in the adaptation of emotional and behavioural problems of second-generation children of NESB skilled immigrants and compared to the second-generation children of ESB skilled immigrants and children of native-born skilled parents at 10 years, 12 years, and 14 years of age.

Aim – II*:* To explore the longitudinal changes in the adaptation of academic achievements in reading and numeracy skills of second-generation children of NESB skilled immigrants and compared to the second-generation children of ESB skilled immigrant and children of native-born skilled parents at 10 years, 12 years, and 14 years of age.

Hypotheses
Longitudinal effect
The patterns predicted above would be observed for data related to children at 10, 12, and 14 years of age.

Hypothesis – I

The longitudinal changes of emotional and behavioural problems of children of NESB immigrants would be positive within themselves from 10 years to following two ages at 12 years and 14 years. Similar changes would be observed compared to the other two groups: children of ESB immigrants and native-born parents from 10 years to 12 years, and 14 years of age.

Hypothesis – II: The longitudinal changes of academic achievement in reading and numeracy performance of children of NESB immigrants would be higher/positive within themselves. Similar trends would be found in both academic skills of children of NESB immigrants compared to other two counterparts: children of ESB immigrants and native-born parents from 10 years to 12 years, and 14 years of age.

1.7.3   Study Three, Four, and Five

Identify the predictors of three outcomes among second-generation children of NESB skilled immigrants at the age of 12 years.

Aim-I: To identify factors that account for individual variances in emotional and behavioural problems and academic achievement in reading and numeracy among second-generation children of skilled immigrants from NESB at the age of 12 years.

Aim-II: To test the applicability of the theoretical framework the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) to the second-generation children of NESB skilled immigrants to Australia.

Hypotheses

Identify the predictors of three outcomes: emotional and behavioural problems and academic achievement in reading and numeracy skills among second-generation children of NESB skilled immigrants at the age of 12 years.

Children's emotional and behavioural problems

1. Children's emotional and behavioural problems would be negatively correlated with

- the quality of their relationship with their main teacher
- their self-esteem.

2.Children emotional and behavioural problems would be positively correlated with

- their primary caregivers' level of psychological distress
- the level of discrimination experienced by the child relative to that experienced by peers belonging to their heritage group
- the level of peer victimisation experienced by the child relative to that experienced by peers belonging to the host group
- their reactivity.

3. The research model depicted in Figure 1.2 would explain a significant amount of variance in children's emotional and behavioural problems in total problem scores from the *Strengths and Difficulties Questionnaire* at the age of 12 years which would be based on the explained variance from the hierarchical multiple regression analyses.

Academic achievement

1. At the age of 12 years, the NAPLAN reading, and numeracy scores would be negatively correlated with
    - self-esteem.
2. At the age of 12 years, the NAPLAN reading, and numeracy scores will be positively correlated with
    - primary caregiver's education level
    - mother's interest in education
    - educational aspirations relative to those of peers in their heritage group
    - positive relationship with their main teacher
    - school engagement
    - persistence in academic tasks
    - Non-verbal intelligence.

3. The research model depicted in Figure 1.3 will explain the significant amount of variance in second-generation children of NESB skilled immigrants' academic achievement in NAPLAN reading and numeracy skills at 12 years of age which would

be based on the explained variances from the hierarchical multiple regression analyses.

1.8   Structure of the thesis

The thesis consists of nine chapters with different accountability. The contents of different chapters are separately discussed below.

This introductory chapter provided a brief overview of thesis topic, including some backgrounds on the existing research and the gaps concerning the adaptation of second-generation children of skilled immigrants from non-English-speaking countries. This chapter identified an appropriate theoretical framework as a guide for three studies (Studies Three, Four, and Five) the "Immigrant Youth Adaptation in Context" framework (Motti-Stefanidi et al., 2012). It also highlighted the aims and hypotheses of all five studies.

Chapter 2 describes the data and research methodology, highlighting their significance and rationale. It elaborates on the archival datasets and the information of the selected samples extracted from datasets. It demonstrates the details of the measurements of all the outcomes and predictors variables and outlines the statistical analysis plan of all the subsequent studies.

Chapter 3 details the attrition analysis. This chapter focuses on determining the magnitude of the loss of participants in LSAC and NAPLAN data over time, and the implications of this for differences in the power of statistical analyses at different child ages in the current study; whether there was any demographic bias in attrition associated likely eroding the representativeness of the samples, and whether any bias in attrition associated with children's past performance is likely to influence the results from between-group comparisons.

Chapter 4 reports on Study One. This cross-sectional study differentiated second-generation immigrant children's groups of NESB and ESB skilled immigrants and native-born parents in emotional and behavioural problems and academic achievement in reading and numeracy skills across three age points (10, 12 and 14 years).

Chapter 5 reports on Study Two. This longitudinal study explores the longitudinal changes of emotional and behavioural problems and academic achievement in reading and numeracy skills among second-generation immigrant children's groups of NESB and ESB skilled immigrants and native-born skilled parents across three age points (10, 12, and 14 years).

Chapter 6 reports on Study Three. This study, guided by the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) framework, identifies predictors of individual differences in emotional and behavioural problems among second-generation children of NESB skilled immigrants at the transition to high school (12 years of age).

Chapter 7 reports on Study Four. Also, guided by the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) framework, identifies predictors of individual differences in academic achievement in reading skills among second-generation children of NESB skilled immigrants at 12 years of age.

Chapter 8 reported Study Five. Guided by "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) framework, this study identifies predictors of individual differences in academic achievement in numeracy skills among second-generation children of NESB skilled immigrants of the same year of age (12 years).

Chapter 9 provides an overall discussion and conclusion, summarising the major findings across all five studies. This chapter highlighted the contribution of the research and the implication of the findings to the literature. It acknowledges the research limitations and recommends areas for future research.

CHAPTER 2 — METHODOLOGY

Data for the predictor and outcome variables were extracted from two large archival longitudinal databases. This chapter describes key points concerning the research methods used to collect the information in these databases and directs readers to sources in which they can find more detailed information .

Data concerning the demographic characteristic of the sample, predictor variables and children's emotional and behavioural problems were drawn from the Longitudinal Study of Australian Children (LSAC). Data concerning children's reading and numeracy skills were drawn from the National Assessment Program-Literacy and Numeracy (NAPLAN). NAPLAN and LSAC data were able to be integrated with the LSAC by applying for the children's unique identification number.

2.1 The Longitudinal Study of Australian Children

This thesis extracted data from the "Growing Up in Australia: LSAC archival data set" for all five studies. LSAC is the first nationally representative longitudinal study of child development in Australia. This is a broad, multi-disciplinary study that was developed to examine the impact of Australia's unique social, economic, and cultural environment on the next generation, particularly regarding issues of policy relevance. Data collection focused on identifying the developmental pathways that Australian children follow and the factors (both positive and negative) that predict the course of these pathways. LSAC was conducted through a partnership between the Australian Department of Social Services (DSS), the Australian Institute of Family Studies (AIFS), and the Australian Bureau of Statistics (ABS).

2.1.1 Sampling

Although it is desirable to base policy and practice recommendations on nationally representative samples, this is not feasible for individual researchers. Consequently, most research on adaptation among children of immigrants is based on convenience samples. The LSAC database provided a unique opportunity to access nationally representative data.

The LSAC's commenced in 2004 with a representative sample of Australian children from two cohorts: the Baby Cohort (aged from 0 to 1 year old) and the Kindergarten Cohort

(aged from 4 to 5 years old). The reference population for both cohorts was the national population of children of the relevant age. Special legislation was passed to allow children of the appropriate ages to be identified from confidential records held by Australia's universal health insurance provider, Medicare. These records included all children except those living in some very remote communities (Mohal, 2021).

Stratified random sampling was used to achieve a scaled sample that was proportionally representation of the population across Australia. The population was ordered by date of birth within selected postcodes, and then a random start and skip process was applied to select the children. The number of children selected depended on which stratum the postcode was in. For most postcodes, the aim of the LSAC was to recruit about 20 children per cohort per postcode. This process allowed all children living in Australia who were relevant ages to be identified.

To recruit a target population of approximately 5,000 children in each cohort, an initial mailout sent 18,814 invitations. Contact details proved to be valid for only 16,342 of these families. Of these, a total of 10,090 families were successfully recruited and completed Wave 1 data collection. This represents a 61.7% participation rate (Australian Bureau of Statistics LSAC processing team and the Australian Bureau of Statistics Household Survey Methodology team, 2020).

2.1.2   Attrition

The sampling strategy for LSAC was designed to accommodate a reduction in the number of active participants from wave to wave. Children were lost to follow-up due to death, loss of contact due to an unknown new address, or because they or their parents declined to participate further. Some children were brought back into the LSAC sample after missing a wave when contact was re-established. High attrition is normal in longitudinal research. *" Of these 10,090 children recruited in the Wave 1 sample, 6,164 children responded in Wave 8, and 5,232 children responded to all waves* (Australian Bureau of Statistics LSAC processing team and the Australian Bureau of Statistics Household Survey Methodology team, 2020).

2.2   Magnitude of attrition from LSAC cohorts

Despite strategies implemented to minimise attrition (Australian Bureau of Statistics LSAC processing Team and the Australian Bureau of Statistics Household Survey Methodology Team, 2020), LSAC had relatively high rates of attrition in both cohorts. Table 2.1 shows the sample size and the percentage of the original samples recruited at 0-1 (Baby Cohort) and 4-5 years of age (Kindergarten Cohort) had lost to attrition by the time the children were 10, 12 and 14 years of age. Table 2.1 shows that more than one in six of the original sample was lost due to attrition at each of the three ages. By the time reached 14 years of age, more than one in three children in the Baby Cohort, and more than one in four children in Kindergarten Cohort had been lost to attrition. The higher attrition rate in Baby Cohort is a direct result of drawing on data from waves that were more distant from the date of recruitment. Table 2.1 shows the sample size and the percentage of the original samples recruited at 0-1 and 4-5 years of age that the Baby and Kindergarten Cohorts had lost to attrition by the time the children were 10, 12 and 14 years of age. These ages correspond to Waves 6, 7, and 8 for Baby Cohort, and Waves 4, 5, and 6 were for the Kindergarten Cohort.

Table 2.1: Sample size and percentage lost to attrition for the Baby and Kindergarten Cohorts in the Longitudinal Study of Children who were lost to attrition at 10, 12, and 14 years of age

Cohorts	Ages (years)				
	0	4	10	12	14
Baby					
Data collection wave	1		6	7	8
Sample size	5107		3764	3381	3127
Attrition rate (%)	-		26.3	33.8	38.8
Kindergarten					
Data collection wave		1	4	5	6
Sample size		4983	4169	3956	3537
Attrition rate (%)		-	16.3	20.6	29.0

Source: (Australian Bureau of Statistics LSAC processing team and the Australian Bureau of Statistics Household Survey Methodology team, 2020)

When the target sample size for each LSAC cohort was chosen, the calculations were based on a prediction that there would be even higher levels of attrition from the Baby Cohort and Kindergarten Cohorts than those that eventuated. These predictions were based on attrition rates in other national longitudinal databases.

2.2.1 Comparison with other longitudinal studies

Attrition rates from the LSAC were similar to, or lower than, those observed in longitudinal surveys of representative samples of children in other Western countries and in longitudinal studies of older adolescents and young adults in Australia. British and North American studies of children of comparable ages to those in LSAC provide useful benchmarks. The UK Millennium Cohort Study (MCS) also recruited a baby cohort. It experienced a 2-year attrition rate of 16% and a 10-year attrition rate of 28% (Connelly &

Platt, 2014). The attrition rates for the Baby Cohort in LSAC were very similar: 9.8% at 2 years and 26.3% at 10 years. The *National Longitudinal Survey of Youth* (NLSY97) in the USA, which collected data when children were twelve to sixteen years old, the age range on which the current thesis focuses, experienced a 4-year attrition rate of 11% (Aughinbaugh, & Gardecki., 2007). This is comparable to the 4-year attrition rates for the Baby (14.1%) and Kindergarten Cohorts (13.1%) in the LSAC. The attrition rate for LSAC is lower than that for Australian longitudinal studies of older children. The *Longitudinal Survey of Australian Youth* (LSAY) experienced a 5-year attrition rate of 35.5% for the Y95 cohort and 45% for the Y98 cohort, and an 8-year attrition rate of 55% in the Y95 cohort (Rothman, 2009). The 5- and 8-year attrition rates for LSAC were approximately half those reported for LSAY (Baby Cohort: 5-years, 14.1%; 8 years, 20.0%; Kindergarten Cohort: 5-years, 13.1%; 8 years, 20.6%).

Attrition is also common in longitudinal studies of immigrants. It is likely that this is at least partly attributable to difficulties in maintaining contact and effective communication across diverse language and cultural backgrounds. Additionally, immigrants are more likely to move from one location to another, which could further exacerbate attrition. For example, a study on immigrant families in New Zealand reported a 1-year attrition rate of 14% (Bryant & Krsinich, 2009). For the current thesis, such findings raise the possibility that the magnitude or nature attrition may differ across comparison groups. An attrition analysis was conducted to determine this (see Chapter 3).

2.2.2   Data collection

Between 2004 and 2020, nine main waves of data collection were conducted at approximately two-year intervals. When these data were collected children in the Baby Cohort were 0-1 years (Wave 1), 2-3 years (Wave 2), 4-5 years (Wave 3), 6-7 years (Wave 4), 8-9 years (Wave 5), 10-11 years (Wave 6), 12-13 years (Wave 7), 14-15 years (Wave 8) and 16-17 years of age (Wave 9). In the Kindergarten Cohort, data were collected when children were 4 -5 years (Wave 1), 6-7 years (Wave 2), 8-9 years (Wave 3), 10-11 years (Wave 4), 12-13 years (Wave 5), 14-15 years (Wave 6), 16 -17 years (Wave 7), 18 – 19 (Wave 8) and 20 -21 years of age (Wave 9).

A two-stage cluster-based design was used to allow the analysis of data from children and families within their communities. Data were collected in multiple ways; face-

to-face interviews, direct assessments of the children, computer-assisted self-interview, and paper questionnaires. Data were collected from parents and other family members, teachers, child carer workers, and the children.

2.3 The National Assessment Program-Literacy and Numeracy (NAPLAN)

The National Assessment Program Literacy and Numeracy (NAPLAN) is a full cohort assessment of students in Years 3, 5, 7, and 9 that monitors the acquisition of literacy and numeracy skills necessary for successful grade transition through national standardised tests in reading, writing, language conventions (spelling, grammar, and punctuation), and numeracy. The NAPLAN uses common national reporting scales so that scale scores can be compared across schools, states, school year levels and over time. For example, a score of 500 in Numeracy for achieved by a student in Year 3 in 2008 reflects the same level of skills as a score of 500 achieved by a student in Year 5 in 2008 or in other years.

NAPLAN assigns students' performance in each area of assessment a score between 0 and 1000, with higher scores representing higher performance. These raw scores were then standardised to form scale scores. To aid the interpretation of scale scores, these were classified into bands, with higher scale scores being assigned to higher bands. Performance in higher bands is needed for a successful transition to each subsequent grade, and the number of bands increases across grades to accommodate this. For example, in Year 3, students' performance is classified into six bands. Band 2 represents the minimum level of skills necessary for a successful transition to Grade 4. However, by Year 5, students' performance is classified into eight bands and Band 4 represents the minimum level of skills necessary for a successful transition. In Years 7 and 9, scale scores in Bands 4 and 5, respectively, represent the minimum level of skills necessary for a successful grade transition (NAPLAN, 2018). The figure attached in *Appendix III, that* replicated directly from the NAPLAN website. It shows the details of banding in their assessment scale.

This thesis accessed children's NAPLAN scaled scores in reading and numeracy. These scores will be interpreted in terms of the bands to which they were assigned at the relevant grade level. In *Appendix IV* displayed the scale score range for each band for

reading and numeracy assessments in Years 3, 5, 7, and 9. Years 5, 7, and 9 which are typically completed by children aged 10, 12, and 14 years, respectively.

2.4   Derivation of the samples used in this thesis

To maximize the sample size, the current program pooled children aged 10-11 years, 12-13 years, and 14-15 years of age in Baby and Kindergarten Cohorts (Figure 2.1).

Figure 2.1: procedure how the sample were extracted from both cohorts according to their age.
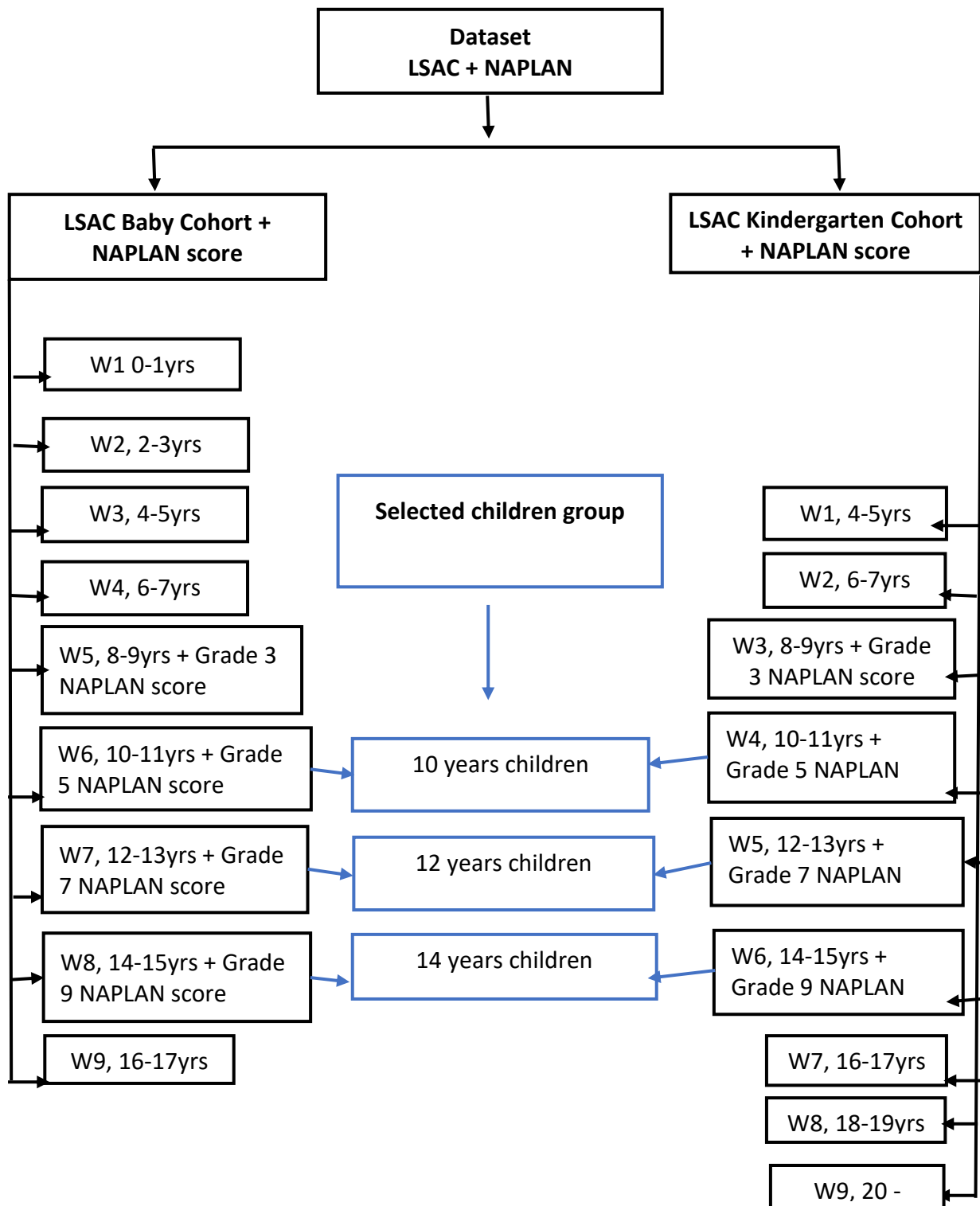
Three groups of children were then selected:

I. Children of skilled immigrants from non-English-speaking countries (NESB)
II. Children of skilled immigrants from English-speaking countries (ESB)
III. Children of native-born parents with high employment skills

The inclusion criterion for inclusion for children of immigrants was that both parents were born outside Australia for children in two parent families or that their sole parent was born outside Australia. The inclusion criterion for high employment skills was that one or both parents had completed an advanced diploma or a higher qualification. Heritage countries were classified as English-speaking or non-English-speaking according to its country's official language as recorded in 'The world factbook' (Central Intelligence Agency, USA, 2014) The inclusion criteria for each of the three comparison groups is summarized in Table 2.2.

Table 2.2: Inclusion criteria of the selected groups

Groups	Inclusion criteria	Some country included in each group
Children of NESB Skilled Immigrants	Second-generation children, children born in the host country (Australia) Both parents born overseas from non-English-speaking background (NESB) unless children have a single parent Either parent has an education background of an advanced diploma or higher	Fiji, Samoa, Germany, Greece, Poland, Iraq, Turkey, Viet Nam, Malaysia, Singapore, China (excludes SARs and Taiwan), Hong Kong (SAR of China), Bangladesh, India, Pakistan, and Chile.
Children of ESB Skilled Immigrants	Second-generation children, children born in the host country (Australia) Both parents born overseas from an English-speaking background (ESB) unless children have a single parent Either parent has an education background of an advanced diploma or higher	New Zealand, United Kingdom, Scotland, Ireland, and the USA.
Children of native-born skilled parents	Children born in Australia to native-born parents. Both parents born in Australia unless children have a single parent Either parent has an education background of an advanced diploma or higher	Australia

However, children were selected from the LSAC data across three age groups: 10 years, 12 years, and 14 years of age for this thesis. To maximise the sample number, samples were extracted from both Baby and the Kindergarten Cohorts in all three ages. The age was chosen as a continuous variable and categorised for respective studies and contexts. At commencement of the LSAC, the samples were large for both cohorts. This thesis derived and extracted the samples according to the inclusion criteria. The details of the samples, derived from three age points, showed in the following figures (Figures 2.1; 2.2 and 2.3).

Figure 2-1: Derivation of the samples of 10-years-old children used in the current thesis
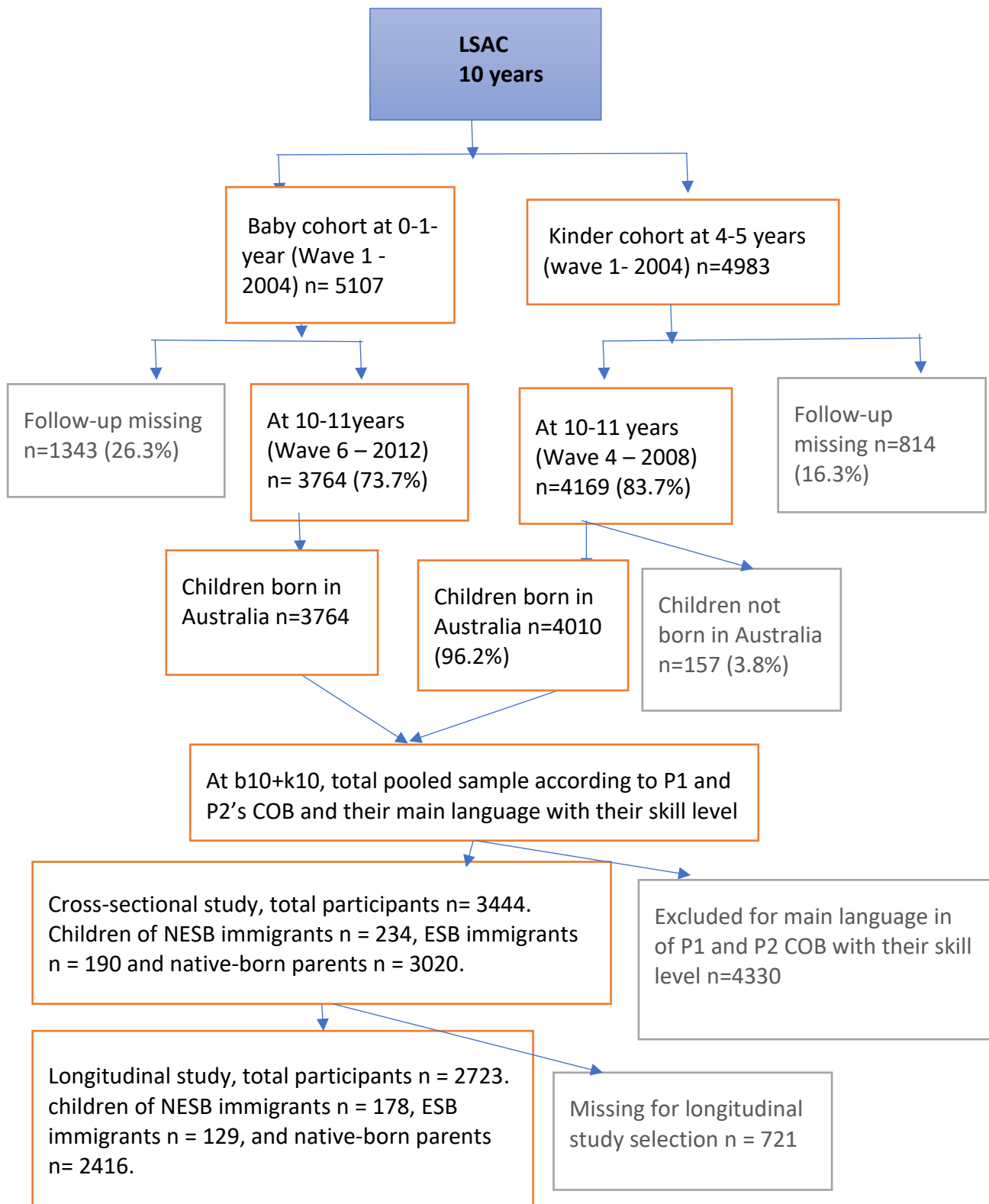
Figure 2-2: Derivation of the samples of 12-years-old children used in the current thesis

```
                        ┌─────────────────┐
                        │      LSAC       │
                        │    12 years     │
                        └─────────────────┘
                ┌────────────────┴────────────────┐
    ┌────────────────────────┐      ┌────────────────────────┐
    │   Baby cohort at 0-     │      │  Kinder cohort at 4-5   │
    │   1-year (Wave 1 -      │      │  years (wave 1- 2004)   │
    │   2004) n= 5107         │      │  n=4983                 │
    └────────────────────────┘      └────────────────────────┘
```

| Follow-up missing n=1343 (26.3%) | At 12-13years (Wave 7 – 2014) n= 3764 (73.7%) | At 12-13 years (Wave 5 – 2010) n= 3956 (79.4%) | Follow-up missing n=814 (20.6%) |

| Children born in Australia n=3764 | Children born in Australia n=3801 (96.1%) | Children not born in Australia n=155 (3.9%) |

At b10+k10, total pooled sample according to P1 and P2's COB and their main language with their skill level

| Cross-sectional study, total participants n= 3362. Children of NESB immigrants n = 218, ESB immigrants n = 172 and native-born parents n = 2972 | Excluded for main language according to P1 and P2 COB with their skill level n=4330 |

| Longitudinal study, total participants n = 2723. children of NESB immigrants n = 178, ESB immigrants and n = 129, and native-born parents n=2416. | Missing for longitudinal study selection n = 639 |

Figure 2-3: Derivation of the samples of 14-years-old children used in the current thesis

```
                            ┌─────────────────┐
                            │      LSAC       │
                            │    14 years     │
                            └─────────────────┘
```

LSAC 14 years

Baby cohort at 0-1-year (Wave 1 - 2004) n= 5107

Kinder cohort at 4-5 years (wave 1- 2004) n=4983

Follow-up missing n=1343 (26.3%)

At 14 -15years (Wave 7 – 2016) n= 3764 (73.7%)

At 14 -15 years (Wave 6 – 2012) n= 3537 (71.0%)

Follow-up missing n=814 (29.0%)

Children born in Australia n=3764

Children born in Australia n= 3395 (96.0%)

Children not born in Australia n=142 (4.0%)

At b10+k10, total pooled sample according to P1 and P2's COB and their main language with their skill level

Cross-sectional study, total participants n= 3151. Children of NESB immigrants n = 202, ESB immigrants n = 169 and native-born parents n = 2780

Excluded for main language in of P1 and P2 COB with their skill level n=4330

Longitudinal study, total participants n = 2723. children of NESB immigrants n = 178, ESB immigrants and n = 129, and native-born parents n= 2416

Missing for longitudinal study selection n = 428

The number of participants in three groups across their three different age points showed in Table 2.4.

Table 2.3: The number of participants in three groups across their three different age points

| Groups | Children age | | | | | | | | | | | |
| | 10 years | | | | 12 years | | | | 14 years | | | |
	n	Male (%)	Mean age	SD	n	Male (%)	Mean age	SD	n	Male (%)	Mean age	SD
Children of non-English-speaking background (NESB) skilled immigrants	234	53.0	10.32	0.47	218	53.7	12.38	0.49	202	53.3	14.35	0.48
Children of English-speaking background (ESB) skilled immigrants	190	55.3	10.38	0.49	172	57.0	12.40	0.49	167	56.9	14.37	0.49
Children of skilled native (Australian)-born parents	3020	50.5	10.38	0.49	2972	50.2	12.45	0.50	2780	50.7	14.37	0.48

2.5   Measurements of outcome variables

The three outcome variables in current program of research were children's emotional and behavioural problems and their academic achievements in reading and numeracy performance at 10, 12, and 14 years of age.

2.5.1   Emotional and behavioural problems

The strength and difficulties questionnaire (SDQ)

The LSAC used the *Strength and Difficulties Questionnaire* (SDQ) (Goodman, 1997) to measure children's emotional and behavioural problems. The SDQ is a behavioural screening questionnaire that is available in forms that are appropriate for children between 3 and 16 years of age. It consists of 25 items which are rated 3-point Likert scales: "not true", "somewhat true" and "certainly true". For most items, these are scored 0, 1, and 2, respectively. However, the scale also includes some items that are reverse scored. The complete list of items can be found in *Appendix V*. The 25 items are divided into one strengths subscale (pro-social behaviour) and four difficulties sub-scales (emotional symptoms, conduct problems, hyperactivity, and problems in peer relationships). Some of the items are, "I try to be nice to other people, I care about their feelings", "I am restless; I cannot stay still for long", "I get a lot of headaches, stomach-aches or sickness", "I get very angry and lose my temper", "I would rather be alone than with people of my age".

This thesis used the total self-reported difficulties score as the measure of emotional and behavioural problems at all ages (10-11 years; age 12-13 years and 14-15 years). The total difficulties score is the simple sum of the four difficulties subscales. Higher total difficulties scores reflect more severe emotional and behavioural problems. Cut scores are provided to aid the interpretation of scores. Total difficulties scores between 0 and 15 are within the normal range, scores between 16 and 19 falls in borderline range, and scores between 20 and 40 indicate that the child is likely to have a mental health problem that warrants clinical intervention. The SDQ was used extensively in other research in Australia and in cross-cultural research and all difficulties subscales have been shown to have adequate internal reliability and validity across diverse contexts (e.g., Hawes & Dadds, 2004). In the current research, the value for Cronbach's alpha for the total difficulties scale

was above or near 0.8 for all comparison groups at all ages, despite their cultural diversity (Table 2.5).

Table 2.4: Cronbach alpha for SDQ according to the selected group

Child Age	Children's group		
	Children of Non-English-speaking background (NESB) skilled immigrant parents (α)	Children of English-speaking background (ESB) skilled immigrants (α)	Children of Native-born skilled parents (α)
10 years	0.76	0.79	0.82
12 years	0.77	0.85	0.82
14 years	0.80	0.82	0.83

2.5.2 Academic achievement in reading and numeracy performance

The National Assessment Program-Literacy and Numeracy (NAPLAN)

This thesis used children's NAPLAN scale scores for reading and numeracy performance as measures of their academic skills in these two domains. NAPLAN tests are administered to students in Years 3, 5, 7, and 9 across all Australian states and territories. The tests are typically conducted on the same day or within the same week to ensure consistency in testing requirements. They are administered in classroom settings during regular school hours to minimize interruptions to the normal school routine. To measure reading performances, students are presented with a variety of reading passages and texts that they need to comprehend, analyse, and interpret. The numeracy component evaluates students' mathematical skills. It covers concepts such as number sense, measurement, geometry, statistics, and problem-solving. Students are presented with mathematical questions that require them to apply various mathematical concepts and operations. NAPLAN tests use a mix of response formats to assess students' skills: multiple-choice questions, short-answer questions, extended responses, and graphs and diagrams. Scoring in NAPLAN can vary depending on the question type and the subject (literacy or numeracy). In general: for multiple-choice questions, students receive a score for each correct answer.

Incorrect answers usually do not result in negative scores. For short-answer and extended-response questions, scoring considers both correctness and the quality of the response. Partial credit may be given for showing correct working even if the final answer is incorrect.

2.6 Measurement of predictors associated with emotional and behavioural problems

2.6.1 Extra-familial heritage cultural context

Discrimination experienced by target children relative to that experienced by peers from their heritage group

This variable assessed whether target children experienced more discrimination that was normative for members of culture group. The score was calculated as the difference between the target child's score for self-reported experience of discrimination and the mean score for self-reported experience of discrimination across other children in their heritage culture group. Discrimination was measured using a 5-item checklist that was custom-designed for the LSAC. The items were: 1. In the last 6 months have you been treated unfairly or badly because of your language or accent? 2. In the last 6 months have you been treated unfairly or badly because of your skin colour? 3. In the last 6 months have you been treated unfairly or badly because of your disability? 4. In the last 6 months have you been treated unfairly or badly because of your religious beliefs? 5. In the last 6 months have you been treated unfairly or badly because of your cultural background? Children were asked to provide a . Yes/No answer to each item. The score for the checklist is the sum of "Yes" responses. Data concerning the psychometric properties of the checklist (i.e., validity, test-retest reliability, cross-cultural validity) are not available for this measure.

2.6.2 Home Context

Primary caregiver's psychological distress

The primary caregiver's mental health was assessed by the six-item short form of the *Kessler Psychological Distress Scale (K-6)* (Kessler et al., 2002). The K6 contains 6 questions related to depression and anxiety. LSAC participants were asked to rate the frequency with which they felt sad, nervous, restless, fidgety, hopeless, and that everything is an effort or worthless, during the last 30 days. The wording of items is provided in *Appendix VI.* Each item is rated on a 5-point scale: "All of the time"(1) "Most of the time"(2), "Some of the

time" (3), "A little of the time" (4), and "None of the time" (5). Low total scores reflect greater psychological distress. Total scores range from 6, which indicates a likely mental health disorder, to 30, which indicates the absence of psychological distress. This measure was used widely in Australia and in cross-cultural contexts. In the current thesis, the scale showed good internal consistency ($\alpha = 0.83$) when used among immigrant caregivers from non-English-speaking countries.

2.6.3   Host culture context

Peer victimization experienced by target children relative to that experienced by peers from the host population

This variable assessed whether target children experienced more peer victimization (Bullying") that was normative for members of host culture group. The score was calculated as the difference between the target child's score for self-reported experience of peer victimization and the mean score for self-reported experience of peer victimization across children in the host culture group. Peer victimisation was measured using a 7-item checklist that was custom-designed for the LSAC. The items are: "Kids hit or kicked me on purpose"; "Kids grabbed or shoved me on purpose," "Kids threatened to hurt me or take my things," "Kids saying mean things to me or called me names," "Kids tried to keep others from being my friend," "Kids did not let me join in what they were doing," and "Kids send me a mean text message/email or posted mean things about me on the Internet (e.g. on Facebook, Myspace)". Further details about this scale are provided in *Appendix VIII*. Children rated the frequency of each event on a 4-point scale: "Never" (1), "Once or twice" (2), "About once a week" (3), "Several times a week' (4). This psychometric properties (validity, test-retest reliability, cross-cultural validity) of the checklist are not available.

Quality of child-teacher relationship

The children's perception of their relationship with their main teacher was measured using an 8-item scale that was custom-designed for LSAC. Sample items include, "I like my teachers," "My teachers respect my feelings," and "My teachers are proud of things I do." All 8 items are attached in Appendix VII. All items were positively worded. The frequency of perception was rated on a 4-point scale ("Almost never or never" (1), "Sometimes true" (2), "Often true" (3), "Almost always or always true" (4)).

69

2.6.4 Child characteristics

Self-esteem

The child's self-esteem was measured by a 5-item scale that was custom-designed for the LSAC. Items were: "Overall, I have a lot to be proud of," "Most things I do, I do well", "Overall, most things I do turn out well," "I can do things as well as most people" and "If I really try, I can do almost anything I want to". Each item is rated on 5-point scale: "False" (1), "Mostly false" (2), "Sometimes false, sometimes true" (3), "Mostly true" (4), "True" (5). Higher scores reflect higher self-esteem.

Reactivity

Reactivity, also known as an irritable temperament, was assessed using a 4-item scale derived from the *Australian Temperament Study*. The items are: "Reacts strongly to disappointment," "Yells at others when angry," "Moody when corrected," and "Responds intensely to disapproval". The frequency of behaviours was rated on a 5-point scale: "Never" (1), "Rarely" (2), "Half the time" (3), "Frequently" (4) and "Always" (5). The scale score is the simple sum of item scores, with higher scores reflecting greater reactivity. The two-sided test performed for all analyses and the level of significance was set at 0.05. Additionally, post hoc t-tests with Bonferroni correction were performed to identify which groups significantly differed from each other.

2.7 Measurement of predictors associated with academic achievements in reading and numeracy skills

2.7.1 Extra-familial heritage cultural context

Target children's educational aspirations relative to those of peers in the heritage culture group

This variable assessed whether target children had higher educational aspirations that was normative for members of their heritage culture group. The score was calculated as the difference between the target child's score educational aspirations and the mean score for educational aspirations across children in the heritage culture group. Children's educational aspirations were measured using a single custom-designed item: "Looking ahead how far you think you will go with your Education?" Children selected one of 5 options: "Leave school before finishing secondary school or completing any further

70

qualification" (1), " Complete secondary school" (2), "Complete a trade or vocational training course" (3), "Complete an undergraduate university degree" (4), "Complete a postgraduate qualification or degree".

2.7.2 Home context

Primary caregiver's Education Level

The primary caregiver's education level was measured using a single self-report item: "Postgraduate degree" (6), "Graduate diploma/certificate" (5), Bachelor's degree (4), Advanced diploma/diploma (3), Certificate (2), "Other" (1). .

Mother's interest in education

Mothers' interest in education was measured by a single custom-designed item completed by children. There were 5 response alternatives: " A lot of interest" (5), " Some interest" (4), " Not much interest" (3), " No interest at all" (2), "Do not have a mother" (1).

2.7.3 Host cultural context

Quality of child-teacher relationship

Children's perception of their relationship with their main teacher was measured using an 8-item scale that was custom-designed for LSAC. Sample items include, "I like my teachers," "My teachers respect my feelings" and "My teachers are proud of things I do." All 8 items are listed in Appendix IV. All items were positively worded. The frequency of perceptions was rated on a 4-point scale: " Almost never or never" (1), "Sometimes true" (2), "Often true" (3), "Almost always or always true" (4).

2.7.4 Child characteristics

School engagement

An 8-point custom-designed scale was used to measure children's school engagement. Example items are "Works hard", "Relates well to other students", and "Absent". This was rated by child's schoolteacher. All items are listed in *Appendix IX*. The frequency of behaviours was rated on a 5- point scale: "Never" (1), " Rarely" (2), "Some of the time" (3), "Most of the time" (4), "All of the time" (5). In this thesis, the scale exhibited strong internal consistency among its items (alpha = 0.996).

Persistence in academic task

The child's persistence was measured using a 4-item custom-designed scale. The items were: "Homework incomplete unless reminded," "Remembers homework without reminders," "Goes back to task after interruption, and "Difficulty completing assignments". The frequency of behaviours was rated on a 5-point scale: "Never" (1), " Rarely" (2), "Half the time" (3), "Frequently" (4), "Always" (5).

Non-verbal intelligence

Non-verbal intelligence was measured using the Matrix Reasoning sub-test of the Wechsler Intelligence Scale (WISC-IV) (Wechsler, 2003). Children's score when they were 10 years of age was used because the test was not administered at 12 years of age. The test contains 35 items, each of which present the child with an incomplete picture. The child is required to complete the figure by choosing one of five options. A higher score represents a higher non-verbal intelligence level.

CHAPTER 3: ATTRITION ANALYSIS

3.1 Overview

The following two chapters involve cross-sectional and longitudinal analyses of adaptation when children participating in LSAC at the ages of 10, 12 and 14 years. Attrition is inevitable in longitudinal data collection but has important consequences. First, because attrition increases across ages and waves, analyses conducted on data from older children have less statistical power than those conducted on data from younger children. Consequently, effect sizes that remain stable over time may meet the criterion for statistical analyses at some ages but not at others. Second, like other forms of non-response, attrition can introduce bias into representative samples:

"The most important consequence [of nonresponse] is that estimates may become biased because the part of the population that is not reached may differ from the part that is sampled. There is now ample evidence that these biases vary considerably … from survey to survey, being sometimes negligible and sometimes large. A second consequence is, of course, that the variances of estimates are increased because the sample obtained is smaller than the target sample." (Cochran, 1977, p. 396)

Third, differences in the magnitude or nature of attrition across comparison groups can distort the differences between them. This can lead to distortion in the observed differences between the groups. This is because the characteristics of those who drop out might not be representative of the entire group, potentially biasing the comparison.

This chapter reports the children flow (changes) over time in sample size and the demographic and performance characteristics of the three comparison groups. It explores whether these changes could affect the samples' representativeness and the interpretation of findings between-group differences.

3.2 Magnitude of attrition among the three comparison groups over time

Typically, longitudinal studies exhibit higher levels of attrition in subsequent waves. As anticipated, the magnitude of attrition was greater in the Baby Cohort compared to the Kindergarten Cohort. This was foreseen due to the Baby Cohort's data being gathered during later waves within the LSAC database (details can be found in Chapter 2-Method). Therefore, it is crucial to investigate the magnitude of attrition within the three groups: children of NESB skilled immigrants and ESB skilled immigrants, and children of native-born skilled parents. This exploration is necessary to accurately understand and explain or interpret their outcomes. A substantial loss of children in one group compared to others could lead to a reduction in sample size and statistical power necessary for a valid explanation of their outcomes.

3.3 Attrition as a threat to efforts to maintain a representative sample

Attrition can be biased; the representativeness of a sample can change over time. This has important implications for the generalisability of the results. Two types of bias are of particular importance for the current thesis: changes in demographic characteristics that could potentially impact children's scores on the outcome measures, and over-representation of children with poor past performance among children to attrition or associated with children's past performance on the outcome measures.

3.3.1 Changes in the distribution of demographic characteristics over time

Numerous demographic characteristics within the samples can change during the course of longitudinal research. Some of these relate to characteristics of participants are expected to show little change over time in a representative sample of the population (e.g., child gender). When changes in these variables are observed, it is an indication that attrition from the sample was biased, and that the sample may no longer be representative of the population from which it was drawn. Other changes in the demographic characteristics of samples reflect common transitions in family composition and socio-economic circumstances over the course of children's lives. For example, For instance, the average count of siblings is likely to increase in the course of any longitudinal study initiated during infancy or early childhood. However, it is probable that this is primarily due to new

births in the family, rather than the over-representation of single-child families in attrition from the study. Whatever their source, it is important to understand changes in children's developmental context when interpreting results.

The focus of the investigation of attrition bias is gender, because this is one of the few demographic characteristics that was unlikely to show significant change over time if the sample retained its representativeness despite the loss of participants. Previous research reported gender differences in emotional and behavioural problems (e.g., Oppedal & Røysamb, 2004; Oppedal, 2017; Roy et al., 2010; Abad et al., 2002), reading (e.g., Sinclair et al., 2006; Wagemaker et al., 1996; Marks, 2007) and numeracy (e.g., Sinclair et al., 2006; Atweh et al., 2012; Legewie & Di Prete, 2012; OECD, 2015, 2016). Such differences were small, and their direction is influences by cultural and contextual factors and by the choice of measures (e.g., whether the measure of mental health focuses on anxiety and depression or on hyperactivity and conduct disorder). Gender differences were also observed among the children of immigrants. For example, studies of immigrant children have often found that girls have a higher risk of experiencing mental health problems than boys (e.g., Kim et al., 2020; Nakash et al., 2012). Gender differences in the reading (OECD, 2006, 2012) and numeracy skills of immigrant children have also been documented in other studies (OECD, 2015, 2016). Hence, potential gender-related biases in attrition from the LSAC study could impact the representativeness of the current samples and introduce biases into between-group comparisons.

Furthermore, two variables that often differ across representative samples of children of different ages, the percentage of single-parent households and the percentage of children living in socio-economically disadvantaged neighbourhoods, were chosen to assess common demographic changes that may influence the interpretation of results. Some previous studies have found an elevated level of behaviour problems (Moilanen & Rantakallio, 1988) and poorer educational performance (Seltzer., 1994) among children from single-parent households. This may be attributable to the greater likelihood that single-parent families experience stress and have lower incomes. Similar outcomes have reported for emotional and behavioural problems among children of immigrants from single-parent families (Beiser et al., 2002). Similarly, movement into and out of socio-economically disadvantaged neighbourhoods is relatively common. For example, families'

disposable incomes often increase when the youngest child begins school either because there is a reduction in childcare costs or because mothers return to paid employment. This may allow families to move to more desirable neighbourhoods. If families living in socio-economically disadvantaged neighbourhoods attend less privileged schools and have access to fewer formal and informal community resources that support positive development (e.g., Anderson et al., 2019; Leventhal & Brooks-Gunn, 2000), they may have lower attainment in literacy and numeracy skills. Various demographic variables are relevant to the continued representativeness of samples in longitudinal research. The current analysis of attrition focused on one variable related to each child (gender); the child's immediate context (single parenting); and the wider context (socio-economically disadvantaged neighbourhood). This choice was guided by the bioecological model of human development (Bronfenbrenner & Morris, 2006).

3.3.2   Changes in the distribution of performance levels over time

The most direct way in which attrition can undermine an accurate understanding of group differences if attrition is biased in terms of children's past performance on the outcome variables. Since past performance is a good predictor of future performance (e.g., Goodman and Scott, 2012; Watts et al., 2014; Zambrana et al., 2020), the findings concerning group differences can be distorted if children with high, moderate, or low past scores are differentially lost from the sample.

3.4   Recovery of participants lost to attrition in longitudinal research.

Occasionally, attrition from longitudinal samples can be reversed. Many longitudinal studies, including LSAC, continue attempts to reconnect with and re-engage participants who miss one or more data collection waves. If these efforts were successful, children whose data were previously unavailable may be reintegrated into the study (e.g., when a study child returns from overseas) (Australian Bureau of Statistics LSAC processing team and the Australian Bureau of Statistics Household Survey Methodology team, 2020).

3.5   Handling with attrition bias

Occasionally, Handling participants lost to attrition in longitudinal research often involves employing statistical techniques to mitigate the biases introduced by the missing data (Ahern & Brocque, 2005). However, according to Rubin's (1976) typology of missing data, understanding the evidence and patterns of attrition is crucial. Rubin's framework categorises missing data into three mechanisms: In cases where the absence of data for a certain variable is unrelated to the actual values of that variable, it is termed missing at random (MAR). When the absence of data doesn't correlate with the values of other observed variables, it is referred to as observed at random (OAR). If a variable meets both the criteria of MAR and OAR, it is classified as missing completely at random (MCAR). Rubin's research established that it's reasonable to disregard the process that led to data being missing if the data follow the MCAR pattern. In this scenario, the missing values of participants are considered to be a random subset of the initial sample, and thus can be omitted from analyses without complication. If the missing data mechanism is not MCAR, various statistical techniques can be applied to counteract the potential biases stemming from attrition.

Weighting is used to assign different weights to participants to make the sample more representative of the original population. These weights account for the differences between participants who were lost to attrition and those who remained in the study (Burkam & Lee, (2000). Imputation techniques can be employed by incorporating weighted variations of the complete data or by estimating conditional probabilities (Hirano et al. 2001). By using multiple imputation, Davey et al. (2001) found that, in comparison with a list-wise deletion of cases with missing data, the application of multiple imputation increased the generalisability and validity of their findings.

Ahern and Brocque, (2005), mentioned to address the impact of participant loss during the study, researchers must address three fundamental questions for each analysis conducted. First, they must evaluate the extent of participant attrition concerning the variables being studied. Second, if attrition is observed, researchers need to ascertain whether it introduces biases to the outcomes. Third, upon detecting

bias, researchers should take steps to counter the effects of attrition by adjusting the variables employed in the analysis or in the interpretation of the results. In addition, while the impact of attrition can vary based on the nature of missing data and the variables, or combinations of variables, being investigated, the presence of sampling attrition does not inherently indicate sample bias (e.g., Nigg et al. 1999).

In conclusion, once the assessment of attrition's effects leads to the conclusion that sampling bias indeed influences the results, it becomes essential to make appropriate adjustments for the missing data, either through statistical methods or by interpreting the findings in context. The theory-based adjustment of attrition is discussed in this section, however, not implemented in this study. It was focused on the adjusting while interpretation the results.

3.6 Aims

The current analysis of attrition had three objectives:

Magnitude of attrition

1. To investigate whether there were variations in attrition rates among the three comparison groups of children at ages 10, 12, and 14 years.

Changes in demographic characteristics

2. To examine whether there were differential changes in three demographic variables (child gender; single parent household; socio-economically disadvantaged neighbourhood) across the three comparisons groups of children at ages 10, 12, and 14 years.

Performance bias in attrition

3a. To examine whether the attrition from the three comparison groups showed a bias with respect to children's past performance on the three outcome variables (emotional and behavioural problems; reading; numeracy) at ages 10, 12, and 14 years.

3.7 Method

3.7.1 Method of calculating attrition

Attrition was calculated by comparing the number of children who were recruited to the initial representative samples for the LSAC with the number of children for whom data relevant to this thesis were available for children in the three comparison groups. Attrition was calculated when the children were 10 years, 12 years, and 14 years of age. For most variables, it was necessary to analyse the extent of attrition and bias in attrition separately for the Baby and Kindergarten cohorts. However, examination of attrition bias associated with children's past performance on outcome measures could be conducted on data pooled across the Baby and Kindergarten Cohorts.

3.7.2 Measurement of demographic variables

The attrition analysis includes three demographic factors: Child's gender, Single-parent household, and socioeconomically disadvantaged neighbourhood. The child's gender was assessed using a single self-report item: "Male" was coded as 1, while female was coded as 2. The child's parent household was evaluated using a single custom-designed item and filled out by the children. The item was formulated as "Does Study Child have 2 parents in the home?" with two response options: "No" (0) and "Yes" (1). Socio-economically disadvantaged neighbourhood was assessed following the Australian Statistical Geography Standard (ASGS). There were four response options: "Major urban population" (0), "Other urban population" (1), "Bounded locality" (2), and "Rural balance the remainder of state/Territory" (3).

3.7.3 Measurement of performance variables

Emotional and behavioural problems

The analysis focused in whether attrition from the sample over-represented children with poor emotional and behavioural adaptation. Poor emotional and behavioural adaptation was defined as a total difficulty score in the borderline or clinical range on the self-report version of the Strengths and Difficulties Questionnaire (Goodman, 1997). (Details about this measure can be found in Chapter 2- Methods). The focus was on attrition of children who met this criterion at the age of 10 years at which the self-report SDQ data

were available. Changes in the percentage of children with poor emotional and behavioural adaptation could be due to improvement in the mental health of children due to clinical intervention or other factors, deterioration in the mental health of children due to additional life stressors or other factors, or over-representation of children with poor emotional and behavioural adaptation among children lost to follow-up. Only the latter represents biased attrition, and therefore this was the focus of the current analysis.

Reading performance

The analysis focused on whether children with low NAPLAN scale scores for reading were over-represented in attrition from the comparison groups. (Details about this measure can be found in Chapter 2- Methods). Low scores were defined scale scores classified in the lowest 3 of the 6 bands in Year 3, the most recent grade prior to the age range on which this thesis focuses. The percentage of children in each comparison group who met the criterion for low reading skills at 8 years was compared with parallel data at 10, 12 and 14 years of age. Changes in the percentage of children with low reading skills could be due to improvement in children's reading skills due to interventions or other causes, failure to make progress in more advanced reading skills assessed in later grades, or the over-representation of children with low reading skills among children lost to follow-up. Only the latter represents biased attrition.

Numeracy performance

The analysis focused on whether children with low NAPLAN scale scores for numeracy were over-represented in attrition from the comparison groups. (Details about this measure can be found in Chapter 2- Methods). Low scores were defined scale scores classified in the lowest 3 of the 6 bands in Year 3, the most recent grade prior to the age range on which this thesis focuses. The percentage of children in each comparison group who met the criterion for low reading skills at 8 years was compared with parallel data at 10, 12 and 14 years of age. Changes in the percentage of children with low reading skills could be due to improvement in children's reading skills due to interventions or other causes, failure to make progress in more advanced reading skills assessed in later grades, or

the over-representation of children with low reading skills among children lost to follow-up. Only the latter represents biased attrition, and therefore was the focus of this analysis.

3.8   Results and Discussion

3.8.1   Magnitude of attrition across in the three comparison groups at 10, 12, and 14 years of age

In all comparison groups, and in both cohorts, attrition increased with child age (Table 3.1). Attrition is higher in both immigrants group and higher in children of NESB immigrants than other two groups. Due to the small size of the two groups of children of immigrants, a small number of children lost to the study translated to a large attrition rate. By 14 years of age, the attrition rate among children of skilled immigrants from NESB was more than double, and the attrition rate among children of skilled immigrants from English-speaking countries was one-and-a-half times that among children of skilled native-born parents. The same pattern was seen in both cohorts, although, as expected, the rates of attrition were systematically higher in the Baby cohort, due to the longer time since recruitment.

Attrition increases the risk that analyses will have insufficient statistical power to detect meaningful differences and associations. Therefore, a power analysis was conducted for the comparisons in the study of longitudinal changes in children's outcomes. Statistical power was determined using an estimated minimum effect size of Cohen's d = 0.25, an alpha level of 0.05. This study had the smallest sample sizes because only children who provided relevant data at all three ages were included in analyses.

In longitudinal study, the comparisons between children of NESB skilled immigrants (n = 178) and children of native-born skilled parents (n = 2416) had high statistical power (0.90). That is, there was a 90% likelihood that the study would detect a difference of this size between these two populations. Comparisons between children of ESB skilled immigrants (n = 129) and children of native-born skilled parents also had high power (.80). Thus, there was an 80% likelihood that the study would detect a difference of this size between these two populations. In contrast, the comparison between children of NESB

81

skilled immigrants and children of ESB skilled immigrants (n = 129) was underpowered. The power was 0.60, indicating there was only a 60% likelihood of detecting a difference of this size between these two populations. This needs to be taken into consideration when interpreting any null findings in comparisons between these groups. Most studies on children of immigrants have a limited number of participants (e.g., Walsh et al., 2010; Fandrem et al., 2009; Strohmeier et al., 2011), and therefore have limited statistical power. In the current research, use of an existing archival dataset meant that the researcher was unable to increase the sample sizes.

Table 3.1: Children in three comparison groups who were retained and who were lost to attrition at 10, 12, and 14 years of age in the Baby and Kindergarten Cohorts in the Longitudinal Study of Australian Children (LSAC)

Cohorts and children ages and Waves	Children of non-English-speaking background (NESB) skilled immigrants			Children of English-speaking background (ESB) skilled immigrants			Children of native (Australian)-born skilled parents		
	Retained	Attrition		Retained	Attrition		Retained	Attrition	
	n	n	%	n	n	%	n	n	%
Baby									
0 years (Wave 1 recruitment)	144	-	-	100	-	-	1739	-	-
10 years (Wave 6)	108	36	25.0	89	11	11.0	1626	113	6.5
12 years (Wave 7)	89	55	38.2	77	23	23.0	1511	228	13.1
14 years (Wave 8)	90	54	37.5	74	26	26.0	1449	290	16.1
Kindergarten									
4 years (Wave1 recruitment)	149	-	-	106	-	-	1459	-	-
10 years (Wave 4)	126	23	15.4	101	5	4.5	1394	65	4.5
12 years (Wave 5)	129	20	13.4	95	11	10.4	1461	-2	- 0.1
14 years (Wave 6)	112	37	24.8	93	13	12.3	1331	128	8.8

3.8.2 Demographic changes in the samples

Changes over time in the composition of the three samples with respect to percentage of males, single-parent households, and residence in a socio-economically for Baby and Kindergarten Cohorts showed in Tables 3.2, 3.3, and 3.4, respectively. Note that although data for the two cohorts were reported separately, the main analyses were conducted on samples of children pooled across the two cohorts. Therefore, a bias that is observed in one cohort may be magnified, reduced, or eliminated by the pattern of data in the other cohort.

Child gender

Random selection in large samples leads to an accurate reflection of the demographic characteristics of the population from which participants were drawn. In contrast, in small samples random processes may lead to over- or under-representation of children with particular demographic characteristics. Males represent 51 percent of the population of Australian children aged 0 to 14 years of age (Australian Bureau of Statistics, 2018). It would be expected that a similar percentage of the population of children born to immigrants after their arrival in Australia would be male. However, Table 3.2 shows that initially, the two small samples of children of skilled immigrants in the Baby Cohort deviated from this by 5 percent or more. Unexpectedly, attrition from the sample reduced, rather than introduced, a gender bias in these samples. In contrast, in the Kindergarten Cohort, attrition introduced a gender bias in the sample of children born to skilled immigrants from ESB. Although the percentage of males in this sample was the same as that in the wider population at recruitment, by 14 years of age boys were over-represented in the sample by almost 10 percent. In conclusion, over-representative male gender was observed only among children of skilled immigrants from English-speaking countries at 14 years in the Kindergarten Cohorts.

However, pooled samples were used in the main analyses for all three groups of children: children of NESB immigrants, children of ESB immigrants and children of native-born parents. Despite this, across child ages, there was a consistent over-representation of male among the children of skilled immigrants from English-speaking countries than the other two groups, but this over-representation was not much different than their

84

recruitment age at 4 years of age. Therefore, this gender over-representation could be ignored or be considered when the findings of children of skilled immigrants from ESB would interpret.

Table 3.2: Male children in three comparison groups at 10, 12, and 14 years of age in the Baby and Kindergarten Cohorts in the Longitudinal Study of Australian Children (LSAC).

Cohort, child age and Wave	Children of non-English-speaking background (NESB) skilled immigrants		Children of English-speaking background (ESB) skilled immigrants		Children of native (Australian)-born skilled parents	
	n	%	n	%	n	%
Baby						
0 years (Wave 1, recruitment)	83	57.6	56	56.0	893	51.4
10 years (Wave 6)	59	54.6	46	51.7	811	49.9
12 years (Wave 7)	50	56.2	44	57.1	744	49.2
14 years (Wave 8)	48	53.3	39	52.7	723	49.9
Kindergarten						
4 years (Wave 1, recruitment)	79	53.0	54	50.9	767	52.6
10 years (Wave 4)	65	51.6	59	58.4	715	51.3
12 years (Wave 5)	67	51.9	54	56.8	748	51.2
14 years (Wave 6)	57	50.9	56	60.2	687	51.6
Pooled samples						
4 years	162	55.3	110	53.45	1660	52.0
10 years	124	53.1	105	55.1	1526	50.6
12 years	117	54.1	98	57.0	1492	50.2
14 years	105	52.1	95	56.45	1410	50.8

Single-parent household

In the Baby Cohort, the proportion of children who lived in single-parent households increased by approximately three times between the age at recruitment and 14 years of age in all comparison groups (Table 3.3). In the shorter period between recruitment and 14 years of age in the Kindergarten Cohort, this percentage was approximately double in all comparison groups. While similar patterns of change were observed across comparison groups within cohorts, at all ages and in both cohorts, the percentage of children of ESB skilled immigrants living in single-parent households was two to three times higher than that in the other two comparison groups. Consequently, higher number of single parent household was observed among children of ESB skilled immigrants at all ages.

In the pooled samples that would be used in the main analyses, was observed the percentage of single parent household for children of skilled immigrant from NESB, children of skilled immigrants from ESB, and children of native-born skilled parents. The higher number of single parent household was noted among children of ESB skilled immigrants at all ages. Therefore, the difference in percentage of single-parent households needs to be considered to interpret the findings of children of skilled immigrants compared to the other two groups.

The age-related increase in the percentage of children living in single-parent households in the samples in this thesis parallels changes in the wider Australian population. The 2021 census found that the percentage of children living in one-parent households increased from 10 percent at 1 year of age to 24 percent at 14 years of age (Australian Institute of Family Studies, 2023). Thus, it is more plausible that the changes observed in the current study are primarily the result of accumulated parental separations rather than the result of an over-representation of children from intact families in attrition from the samples.

Table 3.3: Children in three comparison groups who lived in single-parent households at 10, 12, and 14 years of age in the Baby and Kindergarten Cohorts in the Longitudinal Study of Australian Children (LSAC)

Cohort, child age and Wave	Children living in single-parent households Groups					
	Children of non-English-speaking background (NESB) skilled immigrants		Children of English-speaking background (ESB) skilled immigrants		Children of native (Australian)-born skilled parents	
	n	%	n	%	n	%
Baby						
0 years (Wave 1, recruitment)	5	3.5	10	10.0	52	3.0
10 years (Wave 6)	8	7.4	18	20.2	190	11.7
12 years (Wave 7)	6	6.7	19	24.7	180	11.9
14 years (Wave 8)	9	10.0	21	28.4	195	13.5
Kindergarten						
4 years (Wave 1, recruitment)	7	4.7	18	17.0	95	6.5
10 years (Wave 4)	10	7.9	28	27.7	146	10.5
12 years (Wave 5)	13	10.1	30	31.6	169	11.6
14 years (Wave 6)	9	8.0	28	30.1	169	12.7
Pooled samples						
4 years	12	4.1	28	13.5	147	4.8
10 years	18	7.7	46	24.0	336	11.1
12 years	19	8.4	49	28.2	349	11.8
14 years	18	9.0	49	29.3	364	13.1

Socio-economically disadvantage neighbourhood

The three comparison groups appeared to show different patterns of change over time in the percentage of children living in a socio-economically disadvantaged neighbourhoods (Table 3.4). There were relatively small changes in this percentage between the age of recruitment and 14 years in both cohorts for the children of skilled immigrants from NESB. In contrast, the percentage of children living in such neighbourhoods declined

by about one-third in both cohorts for the children of skilled immigrants from ESB, and by about one-quarter in both cohorts for the children of skilled native-born parents. The percentage difference of children living in a socio-economically disadvantaged neighbourhoods among three groups shows negligible bias, that would allow continue with analysis (Ahern & Brocque, 2005). Therefore, this demographic variable would not need to consider for interpreting the findings of all three groups.

However, pooled sample was used in the main analyses, to explore the outcomes of all three groups: children of NESB immigrant, children of ESB immigrants and children of native-born parents. Unexpectedly, attrition from the sample reduced who living in a socio-economically disadvantaged neighbourhoods rather than introduced a bias, shows more negligible changes in older ages.

Table 3.4: Children whose parents lived in socio-economically disadvantage neighbourhood at 10, 12, and 14 years of age in three groups in the Baby and Kindergarten Cohorts in the Longitudinal Study of Australian Children (LSAC)

Cohorts and children ages and Waves	Groups					
	Children of non-English-speaking background (NESB) skilled immigrants		Children of English-speaking background (ESB) skilled immigrants		Children of native (Australian)-born skilled parents	
	n	(%)	n	(%)	n	(%)
Baby						
0 years (Wave 1, recruitment)	52	36.1	27	27.0	773	44.5
10 years (Wave 6)	41	38.0	19	21.3	529	32.5
12 years (Wave 7)	29	32.6	17	22.1	525	34.8
14 years (Wave 8)	30	33.3	15	20.3	504	34.8
Kindergarten						
4 years (Wave 1, recruitment)	42	28.2	34	32.1	626	42.9
10 years (Wave 4)	40	31.7	24	23.8	568	40.7
12 years (Wave 5)	38	29.5	22	23.2	510	34.9
14 years (Wave 6)	31	27.7	19	20.4	459	34.5
Pooled samples						
4 years	94	32.2	61	29.6	1399	43.7
10 years	81	34.9	43	22.6	1097	36.6
12 years	67	33.0	39	22.7	1035	34.9
14 years	61	30.5	34	20.4	963	34.7

3.8.3   Performance bias in attrition

Analyses explored whether attrition from the three comparison groups was biased in terms of children's performance on the outcome measures: emotional and behavioural problems; academic achievement in reading performance and academic achievement in

numeracy performance. The pooled samples obtained from the Baby and Kindergarten Cohorts were utilized to improve the precision, increase the statistical power, and reduce the sample variability.

Emotional and behavioural problems

In all comparison groups, the number of children with poor emotional and behavioural wellbeing at 10 years of age who were retained in the sample decreased by between one-fifth and one-third between 12 and 14 years of age (Table 3.5). The rate of attrition was higher among children of ESB skilled immigrants than that in the other two comparison groups at both ages. They lost one-third of children with poor emotional and behavioural wellbeing at both subsequent ages. In conclusion, it would need to be consider when finding related children of skilled immigrant from English-speaking countries would interpret.

Table 3.5: Attrition of children with poor emotional and behavioural wellbeing at 10 years from three comparison groups at 12 and 14 years of age.

Child ages	Children with poor emotional and behavioural adaptation at 10 years of age								
	Children of non-English-speaking background (NESB) skilled immigrants (n = 22)			Children of English-speaking background (ESB) skilled immigrants (n = 24)			Children of native (Australian)-born skilled parents (n = 464)		
	Retained	Attrition		Retained	Attrition		Retained	Attrition	
	n	n	% change	n	n	% change	n	n	% change
12 years	18	4	18.2	15	9	37.5	413	51	11.0
14 years	17	5	22.7	16	8	33.3	363	101	21.8

Reading performance

In all comparison groups, the number of children who had low NAPLAN reading scale scores at 8 years of age who were retained in the sample decreased by between one-third and one-half between 8 and 14 years of age (Table 3.6). Closer percentage of decreased have observed among Children of NESB skilled immigrants and children of native-born skilled parents by between one-third and little over one-third at 14 years. The number of children who had low NAPLAN reading scale scores were retained in the sample decreased by one-half among children of ESB skilled immigrants at 14 years of age. In conclusion, this higher percentage of decreased among children of ESB skilled immigrants with lower reading scores had possibility to create bias on this group findings, that need to be discussed for their result interpretation.

Table 3.6: Attrition at 10, 12 and 14 years of age of children with low NAPLAN reading scores at 8 years of age from three comparison groups

Child age	Children with low NAPLAN scale scores for reading at 8 years of age								
	Children of non-English-speaking background (NESB) skilled immigrants (n = 29)			Children of English-speaking background (ESB) skilled immigrants (n = 28)			Children of native (Australian)-born skilled parents (n = 460)		
	Retained	Attrition		Retained	Attrition		Retained	Attrition	
	n	n	% change	n	n	% change	n	n	% change
10 years	25	4	13.8	20	8	28.6	369	91	19.2
12 years	21	8	27.6	19	9	32.1	342	118	25.7
14 years	19	10	34.5	14	14	50.0	280	180	39.1

Numeracy performance

In all comparison groups, there was a reduction of around 40 percent in the count of children with low NAPLAN numeracy scale scores at 8 years of age who remained part of the sample between the ages of 8 and 14 years (Table 3.6). While the decrease was substantial across all groups, three comparison groups exhibited a comparable reduction rate by the time they reached 14 years of age. As a result, the proportional decline in children with low NAPLAN numeracy scale scores at 8 years of age across these three groups during subsequent ages would have a similar impact. This similarity could be disregarded during the analysis and interpretation of the results.

Table 3.7: Attrition at 10, 12 and 14 years of age of children with low NAPLAN numeracy scores at 8 years of age from three comparison groups

	Children with Low NAPLAN scale scores for numeracy at 8 years of age								
Child age	Children of non-English-speaking background (NESB) skilled immigrants (n = 40)			Children of English-speaking background (ESB) skilled immigrants (n = 44)			Children of native (Australian)-born skilled parents (n = 629)		
	Retained	Attrition		Retained	Attrition		Retained	Attrition	
	n	n	%	n	n	%	n	n	%
10 years (Wave 4)	29	11	29.5	37	7	15.9	520	109	17.3
12 years (Wave 5)	29	11	29.5	30	14	31.8	459	170	27.0
14 years (Wave 6)	23	17	42.5	27	17	38.6	395	234	37.2

3.9 Conclusion

Attrition analysis is crucial in research studies, particularly in longitudinal, for understanding the children dropout, bias assessment, validity check, and statistical adjustment. The impact of attrition on outcomes and how it affects the way results are understood must be considered in every longitudinal study. All attrition reduces the statistical power of quantitative analyses. This chapter introduces the attrition analysis for examining the magnitude of attrition among the three groups of children over time. This chapter also examined the reduction in the distribution of demographic attributes and shifts in performance level distribution over the course of time.

The magnitude of attrition among the three comparison groups increased as age progressed in both the Baby and Kindergarten Cohorts. Consequently, the statistical power of analyses would vary between younger and older age groups. To address this, the effect size was assessed to determine whether significant findings at younger ages and insignificant findings at older ages indicated distinct trends in the data. In addition, the percentage of the samples lost to attrition was at least one and half-times higher in both groups of children of immigrants. Therefore, analyses at younger and older ages would differ in their statistical power among immigrant groups. To recompense for this, the effect size for results of both immigrant groups would be observed when arbitrating whether significant results at younger ages and non-significant results at older ages imitate diverse patterns in the data.

Demographic biases in attrition are likely to erode the representativeness of the samples. The current analyses focused on three demographic characteristics: child gender; single parent household; and socio-economically disadvantaged neighbourhood. Only the gender in three demographic variables had possibility to create representative bias across the three groups in both cohorts, the findings of attrition analysis showed some changes in later ages according to gender, but differences on over-representation were small across the groups except among children of ESB skilled immigrants at 14 years of age in Kindergarten Cohort. When pooled sample was considered this over-representation was not much different than their recruitment age at 4 years of age. The higher number of single parent household was displayed among children of ESB skilled immigrants at all ages. In the

current analyses, it would observe that the effect size for results of children of ESB skilled immigrants, as compared to the other two groups, exhibits distinct patterns between younger and older age groups and interpret in the findings.

The pooled samples obtained from the Baby and Kindergarten Cohorts were utilized for examining the performance bias across three groups of children over the years of age. The findings regarding group disparities could be misleading if there's a biased attrition leading to the uneven loss of children with low scores from the three comparison groups. Attrition was close to each other group except children of ESB immigrants (they lost more than other two groups) according to the percentage of loss of poorer emotional and behavioural health. The percentage of losing poorer reading performers were close among groups except children of ESB immigrants. There was minor difference in lost to follow up rates of poor reading performers among children of NESB immigrants and children of native-born parents in the following three years. In addition, the number of poorer performers in numeracy skills were decrease over time, but all three groups showed similar pattern of attrition rates in most subsequent ages. The findings assured all three outcomes of all groups of children, except children ESB immigrants in their emotional and behavioural problems outcome, did not mislead by performance bias in cross-sectional study and longitudinal trajectory.

This chapter emphasised to employ simple statistics and descriptives in the attrition analysis to streamline the complexity of analysis and presentation of demographic and performance characteristics. The future works will attempt to investigate further analysis by using various factors, for example, NAPLAN test and non-cognitive outcomes in a multifactorial framework.

Overall, though this attrition analysis chapter did not weight for the attrition, but this was necessary to know the overall statistical power of samples and understand the possible scenario behind the outcomes. Attrition analysis chapter was a new addition in longitudinal study on children of skilled immigrants which could be guideline for future longitudinal research.

CHAPTER 4—STUDY ONE: ADAPTATION ACROSS DOMAINS

The adaptation in emotional and behavioural problems, and academic achievement in reading and numeracy performance of second-generation children of skilled immigrants from non-English speaking countries

4.1 Overview

Psychological research on the outcomes of children of immigrants was mainly conducted in four host countries: Germany, The Netherlands, the United Kingdom, and the USA. Most previous research reported poorer emotional and behavioural problems and academic achievement among children of immigrants compared to children of native-born parents (OECD, 2012; Motti-Stefanidi et al., 2008; Oppedal, & Røysamb, 2004). Until recently, the focus on immigrant groups was on first-generation, or pooled samples of first and second-generation children, of mainly unskilled immigrant backgrounds. Consequently, it was not clear that previous findings would be able to explain the adaptation of second-generation immigrant children from skilled immigrant backgrounds who lives in a host country with a selective migration policy. The findings were not differentiated according to parents' home language, such as English-language speaking backgrounds (ESB) and non-English-speaking backgrounds (NESB). Acknowledging this gap, this study's differentiating feature is to explain whether similar patterns existed in subsamples of second-generation children of NESB skilled immigrants in Australia compared to second-generation children of ESB skilled immigrants, and children of native-born skilled parents. Children from both immigrant groups were second-generation Australians. Therefore, this study would use children of NESB skilled immigrants and children of ESB skilled immigrants represent both of these second-generation immigrant children. Since all three groups were selected from skilled backgrounds, the label 'skilled' was omitted in the names of these groups.

Australia has a different immigration host context than traditional immigrants host countries. Most immigrants in Australia arrived as 'skilled' due to the selective migration policy. Australia has a multicultural policy and a strong and supportive settlement program for immigrants that includes an English language support program, English as the second language (ESL) program at school for children, skills for education and employment

program, and translating and interpreting services. Although academic achievement gaps between children of immigrants and children of native-born parents were common in high-income countries, immigrants in Australia do not experience the same disadvantage as the USA and Western European countries (Anagonostaki et al. 2016). Data from the Programme for International Student Assessment (PISA) suggest that the academic outcomes for 15-year-old children of immigrants in Australia were that the same or better than children of native-born parents in reading, and mathematics (Akther & Robinson, 2014). A previous study with NAPLAN data in Australia showed that immigrant children outperform native children in both reading and numeracy scores (Islam et al., 2022). This pattern did not appear in most other countries of immigration. The research of Islam et al. (2022) is based on pooled samples of first- and second-generation immigrant children and skilled and unskilled immigrant backgrounds.

Previous research focused on immigrant children's different areas of adaptation, including their acculturation (Berry, 2006); home language maintenance (Alarcon & Parella., 2013; Alarcón, Parella & Yiu., 2014); academic achievement (Alarcón et al., 2014; Haller et al., 2011; Kroneberg, 2008; Motti-Stefanidi et al., 2012; Snow, 2016; Suarez-Orozco et al., 2009), and on psychological well-being (Motti-Stefanidi et al., 2012; Noam et al., 2014; Oppedal, 2017; Oppedal, & Røysamb, 2004; Sam et al., 2008; Steinhausen et al., 2009; Trejos-Castillo et al., 2009). Most research is focused on second-generation immigrant children of unskilled immigrant backgrounds. The immigrant host context in these studies is different than Australia. Existing studies generally do not separate their samples into sub-groups showing the parent's home origin language, such as an English versus non-English language speaking country backgrounds, whereas children from NESB skilled immigrant families may face challenges in developing their reading and numeracy skills due to language barriers and cultural differences (Thompson, 2020). Research reported that these children may perform below their peers in reading and numeracy skills (Hirschfield & Bussière, 2017; Thompson, 2020; Toppelberg et al., 2010). Therefore, the distinct challenges, and outcomes of children of skilled NESB immigrants remains somewhat unknown.

Children's adaptation encompasses the accomplishment of age-appropriate developmental tasks according to their culture (Havinghurst, 1948, 1974; Neugarten et al.,

1965). Developmental tasks and the ages at which they were expected to mark these tasks could be differ according to the diverse cultures of immigrant children. However, these tasks can be classified as predominantly internal or predominantly external domains of adaptation. Successfully handling or completion of both domains of adaptation refers to their/children's positive adaptation. For school-age children age-appropriate tasks include academic achievement (a predominantly external domain) and maintaining psycho-social wellbeing(a predominantly internal domain). This study focused on the adaptation of both domains (emotional and behavioural problems and academic achievement in reading and numeracy performance) of NESB immigrants compared to children of native-born parents and children of ESB immigrants.

4.2   Emotional and behavioural problems

The existing research literature explains the emotional and behavioural problems of children of immigrants and children of native-born parents in Australia and other countries worldwide. Study findings were categorised into distinct types of ideas about the mental health problems of children of immigrants. Most found a disadvantage outcome compared to their native peers (e.g., Oppedal, & Røysamb, 2004; Motti-Stefanidi et al., 2008; Motti-Stefanidi et al., 2008). The immigrant paradox was another common pattern in children's mental health problems; some research showed immigrant advantage or healthy immigrant phenomenon on their emotional and behavioural problems. Most studies were conducted in the USA, followed by Europe (mainly in Sweden, the United Kingdom, Greece, Norway, Austria, and The Netherlands), and Canada. The immigrant background was mainly Latino Hispanic, Asia and mixed with these or other different countries. Most studies were quantitative in nature and included children of immigrants with emotional and behavioural problems.

The majority of studies focused on emotional or behavioural problems were based on either first-generation or mix of first and second-generation, or different types of generation. They reported higher levels of emotional and behavioural problems for children of immigrants than children of native-born parents (Motti-Stefanidi et al., 2012; Noam, et al., 2014; Oppedal, 2017; Oppedal, & Røysamb, 2004). This served to define immigrant status as a risk factor for the children's emotional and behavioural health. Children of

immigrants reported poorer emotional and behavioural health than children of native-born parents. Stevens et al. (2015) focussed on both first- and second-generation immigrant children and reported higher levels of emotional and behavioural problems (higher levels of physical fighting and bullying and lower life satisfaction) than their counterparts' native children (Stevens et al., 2015). This study was a cross-cultural study, and the host country background was Denmark, Germany, Greece, Iceland, Ireland, Italy, the Netherlands, Spain, the USA, and Wales.

In contrast, in some research first-generation immigrant children showed a lower level of emotional and behavioural problems than children of native parents, but this disappeared in second-generation immigrant children (Bowe, 2017; Cervantes, Padilla, Napper, & Goldbach, 2013; Salas-Wright, Kagotho, & Vaughn, 2014). This adaptation pattern is known as the immigrant paradox where first-generation immigrant children had significantly lower levels of diagnosed emotional and behavioural problems compared to native-born Americans and second-generation immigrant children. Studies resulted in an immigrant context from the literature in the UK (Bowe, 2017), and the United States of America (Cervantes et al. 2013; Salas-Wright et al. 2014). These well-known immigrant host countries demonstrated different immigrant contexts compared to Australia as an immigrant host country according to immigrant selection procedures and their settlement and support programs. Therefore, it was unclear whether similar findings could reveal emotional and behavioural problems of second-generation immigrant children in Australia.

Some previous research found an immigrant advantage or healthy immigrant phenomenon (Dekeyser et al., 2011; Vaage et al., 2009). They found an immigrant advantage exists in mental health among children of immigrants and they did not show any difference compared to children of native-born parents in emotional and behavioural problems, both studies did not report on sub-samples according to children's home language and their parents' skill level. Consequently, the result was not clear; a similar result could be found with second-generation immigrant children whose home language was not English and whose parents had higher skill levels. In both Dekeyser et al. (2011) and Vaage et al. (2009), the studies were conducted in the European context of immigrant settlement, one in Sweden and the other in Finland, the Netherlands, Norway, and Sweden. The multicultural policy in those countries is similar to the Australian host context for

immigrants. There is a possibility that the healthy immigrant phenomenon on the emotional and behavioural problems of children of NESB skilled immigrants would be identified from Australian data.

4.3 Academic achievement in reading performance

There is limited literature focused on academic achievement in the reading skills of second-generation immigrant children. Some studies focused on both academic areas; reading and numeracy (e.g., Chen et al., 2015; Ly et al., 2012; Reardon & Galindo, 2009; and Rosenbaum & Rochford, 2008). A smaller number of studies focused on only the reading performance of second-generation immigrant children (e.g., Cobb-Clark et al., 2012). Most studies were conducted in the USA, and few were conducted in several OECD countries. Immigrants mostly had Chinese, Hispanic, Mexican, and Asian backgrounds, and used mixed samples from different countries. Some selected studies on second-generation immigrant children and their academic achievement in reading skills were based on longitudinal data (Ly et al., 2012; Reardon & Galindo, 2009). One of the reviewed studies showed that first-generation Chinese students have an advantage compared to native students (Bodovski & Durham, 2010). The advantage was not apparent among their second and third-generation samples, respectively. This study was conducted on Asian Americans in the USA. They did not separate their findings according to their heritage country language and parents' skill levels. Consequently, it was unclear this finding will be similar on academic achievement in the reading performance of children of NESB immigrants in Australia where selective migration policy has been followed.

4.4 Academic achievement in numeracy performance

A smaller number of research conducted on second-generation immigrant children's academic achievement in numeracy performance. Among previous research, some studies have focused on second-generation immigrant children and their academic achievement in both reading and numeracy performance (e.g., Chen et al., 2015; Ly et al., 2012; Reardon & Galindo, 2009; and Rosenbaum & Rochford, 2008), but few studies have focussed discretely on numeracy scores (e.g., Bodovski & Durham, 2010; Bumgarner et al., 2013; Dustmann et al., 2012). Most studies have been conducted in the USA and only a few studies in OECD countries. The majority of children of immigrant backgrounds were of Chinese Americans;

Latino, Mexican, or Asian backgrounds, with many studies mixing samples from different countries. Quantitative methods were applied in most studies, with some studies based on longitudinal data (e.g., Bodovski & Durham, 2010; Bumgarner et al., 2013; Ly et al., 2012; Reardon & Galindo, 2009). Bodovski and Durham. (2010) studied Asian American children of Chinese immigrants in the USA. They showed first-generation immigrant children have an advantage in academic outcomes, compared to native parents and second-generation immigrant children. However, their findings were not based on to their heritage country language and parents" skill levels. Consequently, it was unclear this finding will be similar on academic achievement in the numeracy performance of second-generation immigrant children who have heritage language country backgrounds other than English and their parents have higher skill levels and lives in country where selective migration policy has been followed. Acknowledging this gap, this study would explore the adaptation levels on academic achievement in numeracy performance of children of NESB immigrants in Australia.

4.5 Research aims

Children's group differences, parent immigrant status, and the home language effect on second-generation children of NESB skilled immigrants' emotional and behavioural problems and academic achievement in reading and numeracy performance were compared to second-generation children of ESB skilled immigrants and children of native-born skilled parents.

Aim – I: To compare the children's group differences in the level of emotional and behavioural problems and academic achievements in reading and numeracy performance among second-generation children of NESB skilled immigrants, second-generation children of ESB skilled immigrants, and children of native-born parents at 10, 12, and 14 years of age.

Aim –II: To compare the level of emotional and behavioural problems according to parents' immigrant status and home language, between second-generation children of both NESB and ESB skilled immigrants and the children of native-born skilled parents at 10, 12, and 14 years of age.

Aim – III: To compare the level of academic achievements in reading performance according to parents' immigrant status and home language, between second-generation children of both NESB and ESB skilled immigrants and the children of native-born skilled parents at 10, 12, and 14 years of age.

Aim – IV: To compare the level of academic achievements in numeracy performance according to parents' immigrant status and home language between second-generation children of both NESB and ESB skilled immigrants and the children of native-born skilled parents at 10, 12, and 14 years of age.

4.6 Hypothesis

Group differences:

Psycho-social wellbeing: The level of emotional and behavioural problems among children of skilled immigrants from NESB would be lower compared to children of native-born skilled parents and children of ESB skilled immigrants.

Academic achievement: The level of reading and numeracy performance among children of skilled immigrants from NESB would be higher compared to children of native-born skilled parents and s children of ESB skilled immigrants.

Immigrant effect:

Psycho-social wellbeing: The level of emotional and behavioural problems among children of skilled immigrants from NESB and skilled immigrants from ESB would be lower compared to children of native-born skilled parents.

Academic achievement: Reading and numeracy performance among children of skilled immigrants from NESB and skilled immigrants from ESB would be higher compared to children of native-born skilled parents.

Language effect:

Psycho-social wellbeing: The level of emotional and behavioural problems between childrenof skilled immigrants from NESB would be higher compared to skilled immigrants from ESB.

Academic achievement: Reading and numeracy performance between children of skilled immigrants from NESB would be higher compared to children of skilled immigrants from ESB.

4.7 Methods

This study used archival data from two highly representative datasets in Australia: the LSAC, and the NAPLAN datasets. The LSAC dataset included two cohorts, namely the Baby and Kindergarten Cohorts, and same-age data from both cohorts were combined to maximise the participants number in all three ages. Details of both datasets and sample selection procedures were discussed in the Chapter 2, Methodology section of this thesis. The samples consisted of three groups: Australian-born children of skilled immigrants from NESB, skilled immigrants from ESB, and native-born parents. The study considered three age groups, including 10, 12, and 14-year-olds, and measured three outcomes: emotional and behavioural problems, NAPLAN reading scores, and NAPLAN numeracy scores. The study aimed to examine the overall group differences, and the effect of immigrant status and language on the outcomes of three selected groups on three ages. To eliminate confounding variables such as immigrant status, language status, poverty, and low education, the study made two key comparisons by comparing two groups of Australian-born children of skilled immigrants and children of native-born skilled parents with comparable education. A multifactorial research design was followed to explore the effect of immigrant status and language on the outcomes of pre-adolescent to adolescent children of skilled immigrants in Australia (Figure 4.1)

Figure 4-1: Multifactorial research design for the Study One
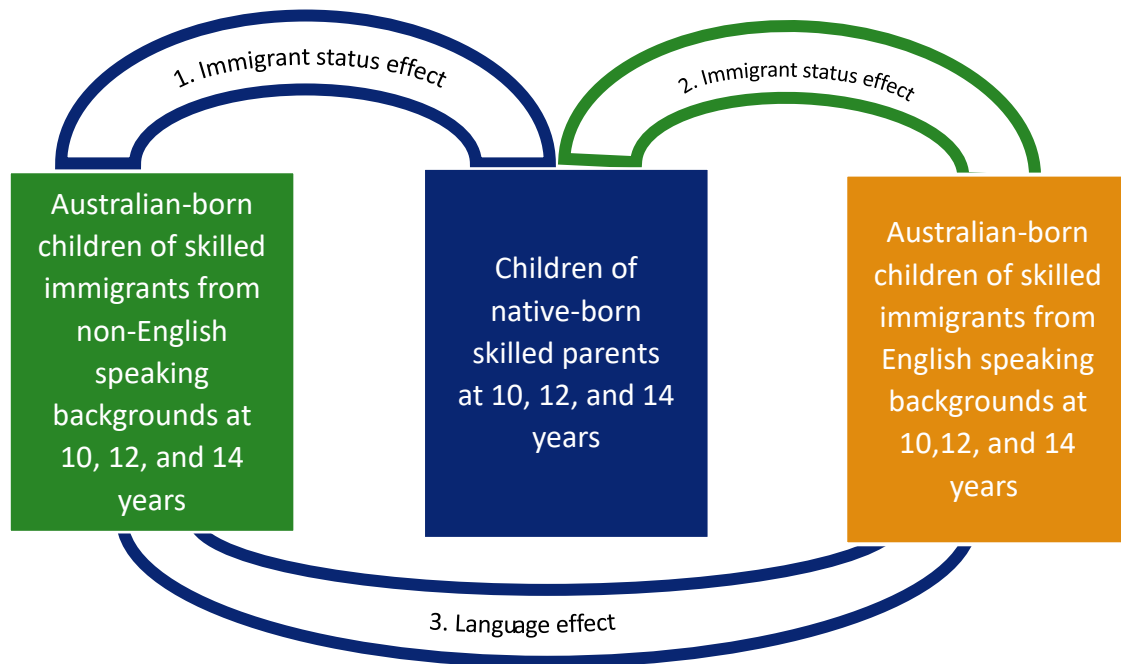
4.7.1 Participants

The participants were chosen based on the pre-adolescent to adolescent stages of development. During this time children encounter a multitude of challenges related to physical (e.g., puberty hits) and psychological changes, increased responsibilities, and they may experience mental health issues in their transitions to new environments such as from primary school to high school.

The participants were divided into three groups: children of skilled immigrants from NESB, children of skilled immigrants from ESB, and children of native-born skilled parents. All children from these three groups were born in Australia. Parents of children from the NESB and ESB skilled immigrants were born in countries other than Australia. Parents of children from the native-born skilled parents were born in Australia. In addition, parents of children from the NESB spoke languages other than English at home, while parents of children from ESB skilled immigrant groups and the native-born skilled parents spoke English language at home, The inclusion criteria for the establishment of these three groups of children are presented in Table 4.1.

Table 4.1: Inclusion criteria of the selected children's groups

Groups	Inclusion criteria	Some country included in each group
Children of NESB Skilled Immigrants	Second-generation children, children born in the host country to the immigrant parents (Australia)	China (excludes SARs and Taiwan), India, Sri Lanka, Vietnam, and Malaysia, etc.
	Both parents born overseas from non-English-speaking background (NESB) unless children have a single parent	
	Either parent has an education background of an advanced diploma or higher	
Children of ESB Skilled Immigrants	Second-generation children, children born in the host country to the immigrant parents (Australia)	New Zealand, United Kingdom, Scotland, Ireland, and USA.
	Both parents born overseas from English speaking background (ESB) unless children have a single parent	
	Either parent has an education background of an advanced diploma or higher	
Children of native-born skilled parents	Children born in Australia to native-born parents.	Australia
	Both parents born in Australia unless children have a single parent	
	Either parent has an education background of an advanced diploma or higher	

Number of participants among three groups

Available participants number for each three-age group presented in Table 4.2. The majority of the children were from native-born parents followed by non-English speaking and English-speaking countries across all age groups.

Table 4.2: The number of participants in three ages among three groups

| Groups | Children age | | | | | | | | | | | | Parents' country of origin |
| | 10 years | | | | 12 years | | | | 14 years | | | | |
	n	Male (%)	Mean age	SD	n	Male (%)	Mean age	SD	n	Male (%)	Mean age	SD	
Children of non-English-speaking background (NESB) skilled immigrants	234	53.0	10.32	0.47	218	53.7	12.38	0.49	202	53.3	14.35	0.48	China (excludes SARs and Taiwan), India, Sri Lanka, Viet Nam, and Malaysia, etc.
Children of English-speaking background (ESB) skilled immigrants	190	55.3	10.38	0.49	172	57.0	12.40	0.49	167	56.9	14.37	0.49	England, New Zealand, and USA, etc.
Children of skilled native (Australian)-born parents	3020	50.5	10.38	0.49	2972	50.2	12.45	0.50	2780	50.7	14.37	0.48	Australia

4.7.2 Measurements of outcome variables

Emotional and behavioural problems

To measure the emotional and behavioural problems of children across different ages, the Strength, and Difficulties Questionnaire (SDQ) developed by Goodman in 1997 was used in the LSAC. The scores were calculated from the questionnaire to assess the emotional and behaviour problems. The SDQ questionnaire consists of 25 items that are rated a 3-point Likert scale: "not true", "somewhat true" and "certainly true", with scores ranging from 0 to 2. The 25 items were categorised into five subscales, including emotional symptoms, conduct problems, hyperactivity, peer relationship problems, and pro-social behaviour. The emotional and behavioural problems were assessed for the same group of children at the ages of 10, 12, and 14 years. The total mental health scores were calculated from 20 items (see appendix V for items), excluding pro-social behaviour. Scores on the SDQ range from 0 to 40, with higher scores indicating more emotional and behavioural problems. Scores between 0-15 fall within the normal range, while scores between 16-19 represent borderline, and scores between 20-40 indicate a clinical cut point. The internal reliability and validity of all subscales were found to be satisfactory (Hawes & Dadds, 2004), with Cronbach's alpha levels for the SDQ total difficulties scale being above or near 0.8 across all three selected groups, despite their linguistic and cultural diversity.

Academic achievement in reading and numeracy

To assess the academic achievement in reading and numeracy performance, NAPLAN scores were extracted from the database. NAPLAN is the national academic assessment program in Australia, which evaluates the students' performance in reading, writing, language conventions (spelling, grammar, and punctuation), and numeracy. In comparison to the five-item questionnaire available in the LSAC database, NAPLAN offers a direct score related to the children's academic achievement in reading and numeracy performance, which makes it a reliable source for academic assessment.

The study examined the academic achievement in reading and numeracy performance among three groups of children in their school Years 5, 7, and 9, using the NAPLAN results. The assessment scale uses a 1 to 10 band to measure performance in all areas tested, that spans all school year levels. All bands were not reported at all year levels.

A national minimum standard is established for each level, e.g., band 2 for year 3, band 4 for year 5, band 5 for year 7, and band 6 for year 9.

The NAPLAN assessment process is performed using national common reporting scales by the test administration authorities to enable the comparison of given scale scores across school year levels and over time. The scale score ranges from 0 to 1000, which indicates the performance of children in reading and numeracy. The NAPLAN national average score for reading was found to be between 384.8 to 420.1 in year 5, 431.7 to 472.0 in year 7, and 485.5 to 528.7 in year 9, whereas for numeracy, the national average score ranged from 379.2 to 419.4 in year 5, 428.9 to 475.1 in year 7, and 479.4 to 526.1 in year 9.

4.7.3 Measurements of predictors

Immigrant status

The immigrant status of the children was determined based on the birth country of their parents. Specifically, two distinct groups were created based on whether the parents were born in countries with an English-speaking backgrounds or non-English-speaking backgrounds. To be included in these groups, both parents needed to have been born overseas unless the child has a single parent.

Home country language

The children's home language was assessed based on the language spoken by their parents' country of origin. Two groups were formed based on whether the parents were born in countries with an English-speaking backgrounds or non-English-speaking backgrounds.

4.7.4 Analysis plan

Data management and statistical analyses were performed using SPSS version 25 (IBM Corp, 2017). A complete case analysis was performed for analysing and modelling data. The cases for respective variables with missing values were excluded due to the small number of missingness.

Data normalities were visually checked using frequency histograms and normal Q-Q plots. In addition, the Kolmogorov-Smirnov test was used to assess normality. If the

continuous variables were not normally distributed, a transformation of the variables was performed, or non-parametric statistical approaches were used. Any outliers were identified, and analyses were undertaken to determine the impact the outliers have on skewing the data.

Mean and standard deviation (SD) for discrete and continuous data were calculated and categorical variables were presented as percentages. If there are insufficient numbers in each cell, the cells/categories will be collapsed or there will be a notation that the group results in each of the cells based on small numbers and therefore should be treated with caution. For non-normally distributed data, median and interquartile ranges (IQR) were reported.

Descriptive statistics were used to assess the level of emotional and behavioural problems and the level of academic achievement in reading and numeracy among the children of NESB skilled immigrants, children of native-skilled parents, and second-generation children of ESB skilled immigrants. MANCOVA controlling for group differences in gender was used to identify the level of the differences among the three groups and their three outcomes at their three age points. Post hoc tests were performed to assess the effects of immigrant status and language status. The planned explanatory analysis examines changes in children's emotional and behavioural problems and academic achievement in reading and numeracy among children's groups at the age of 10, 12, and 14 years.

4.8   Results

4.8.1   Findings of children of NESB skilled immigrants at their 10 years of age

Overall results

The MANCOVA found there was an overall difference between the three groups in the outcome variables ($F_{(6, 6112)}$ = 19.6; partial η^2 = 0.019; $p < 0.001$).

Emotional and behavioural problems

No differences in emotional and behavioural problems found between the three groups of children ($F_{(2, 3058)}$ = 2.2; partial η^2 = 0.001; $p = 0.12$). The means for all groups fell within the normal range (Figure 4.2).

Figure 4-2: Mean scores on the *Strengths and Difficulties Questionnaire* (SDQ), and reading and numeracy tests from the *National Assessment Program—Literacy and Numeracy* (NAPLAN) for three groups of children

(a) Emotional and behabioral problems

Legend
- ■ Children of non-English- speaking background skilled immigrant parents
- ▨ Children of English-speaking Background skilled immigrant parents
- ⊡ Children of Native-born skilled parents

T Error bars

(b) Reading and numeracy scores
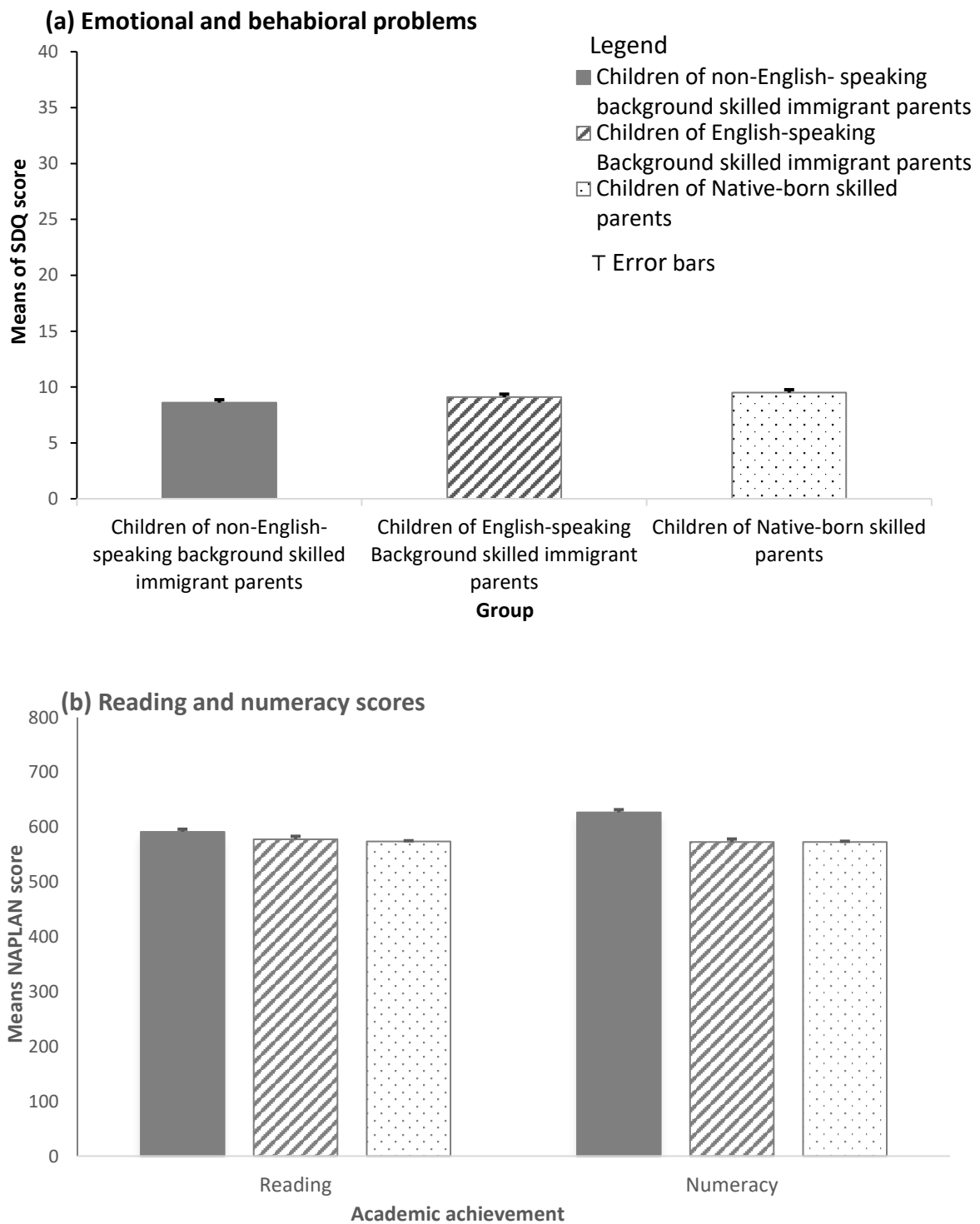
Academic achievement

Reading performance in English

Reading scores differed across the three groups (F(2, 3058) = 3.8; partial η^2 =.002; p = 0.02) (Figure 4.2). Post hoc tests showed that English reading scores for children of skilled immigrants from NESB were higher (t(2894) = 2.7; d = 0.2; p < 0.02; CI = 2.1, 28.7), and children of ESB skilled immigrants had not shown any differences (t(2856) = 0.1; d = 0.01; p = 0.99; CI = -13.8, 15.6) compared to for children of native-born skilled parents. There was no difference between the reading scores for the two groups of second-generation immigrant children (t(368) = 1.8; d = 0.2; p = 0.22; CI = -4.8, 33.7).

Numeracy performance

Numeracy scores differed across the three groups (F(2, 3058) = 49.1; partial η^2 = 0.031; p < 0.001) (Figure 4.2). Post hoc tests showed that numeracy scores for children of skilled immigrants from NESB were higher (t(2894) = 10.1; d = 0.7; p < 0.001; CI = 37.5, 61.7), and children of immigrants from ESB had not shown any differences (t(2856) = 0.5; d = 0.04; p = 0.99; CI = -15.9, 10.6) compared to for children of native-born skilled parents. There was significant difference found between the numeracy scores for the two groups of second-generation immigrant children (t(368) = 7.5; d = 0.8; p<0.001; 95% CI = 34.9, 69.6).

4.8.1 Findings of children of NESB skilled immigrants at their 12 years of age

Overall Results

The MANCOVA found there was an overall difference between the three groups in the outcome variables ($F(6, 5800) = 22.2$; partial $\eta^2 = 0.022$; $p < 0.001$).

Emotional and behavioural problems

No differences in emotional and behavioural problems found between the three groups of children ($F(2, 2902) = 1.9$; partial $\eta^2 = 0.001$; $p = 0.16$). The means for all groups fell within the normal range (Figure 4.3).

Figure 4-3: Mean scores on the *Strengths and Difficulties Questionnaire* (SDQ), and reading and numeracy tests from the *National Assessment Program—Literacy and Numeracy* (NAPLAN) for three groups of children

(a) Emotional and behabioral problems

(b) Reading and numeracy scores
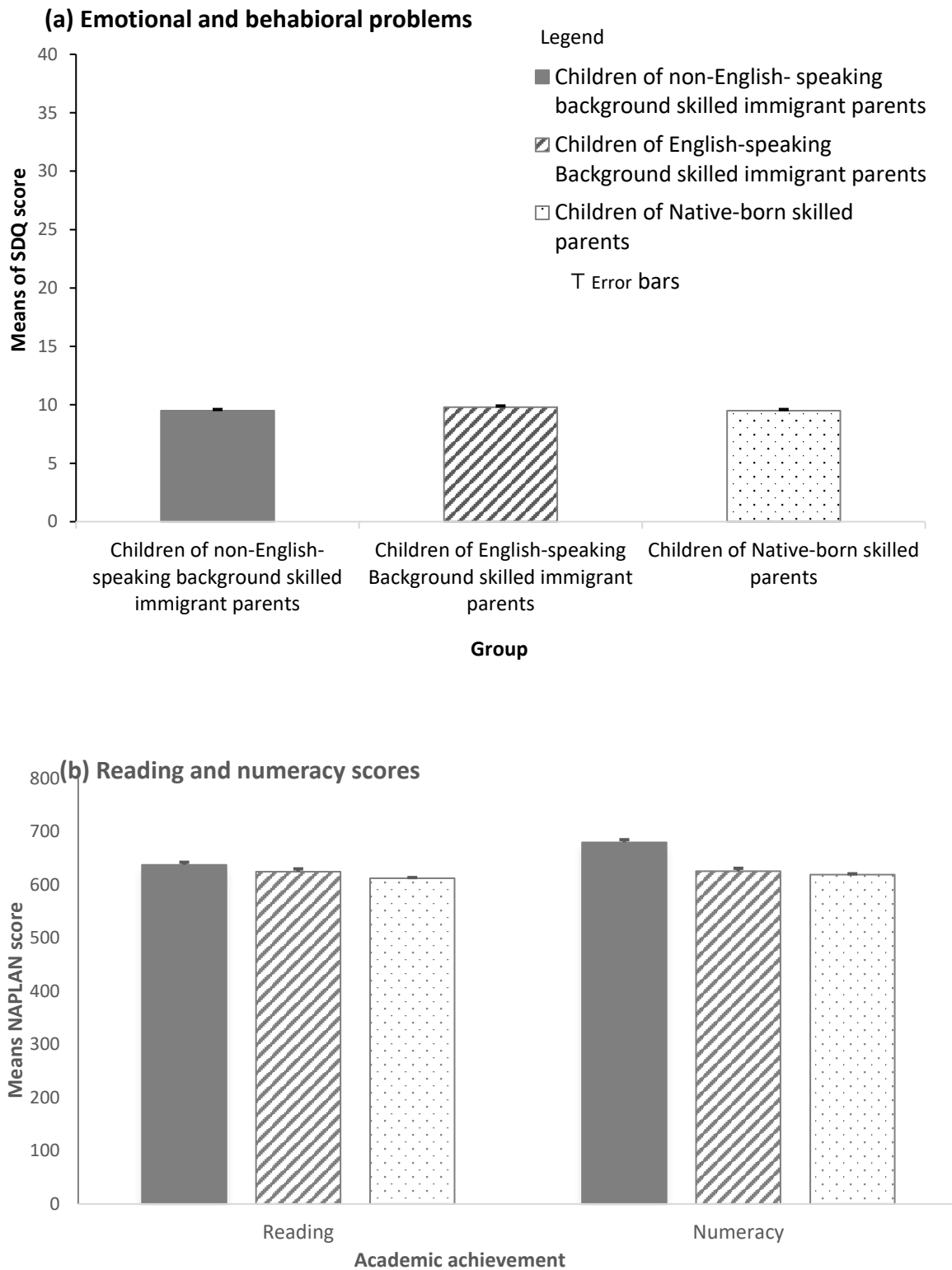
Academic achievement

Reading performance in English

Reading scores differed across the three groups (F(2, 2902) = 6.1; partial η^2 =.004; p = 0.002) (Figure 4.3). Post hoc tests showed that English reading scores for children from NESB skilled immigrants were higher (t(2753) = 3.4; d = 0.3; p < 0.01; 95% CI = 5.316, 29.481), and children of ESB skilled immigrants had not shown any differences (t(2711) = 0.7; d = 0.1; p = 0.99; 95% CI = -9.636, 17.481) compared to for children of native-born skilled parents. There was no difference between the reading scores for the two groups of second-generation immigrant children (t(342) = 1.8; d = 0.2; p = 0.20; 95% CI = -4.11, 31.061).

Numeracy performance

Numeracy scores differed across the three groups (F(2, 2902) = 56.3; partial η^2 = 0.037; p < 0.001) (Figure 4.3). Post hoc tests showed that numeracy scores for children of NESB skilled immigrants were higher (t(2753) = 10.6; d = 0.8; p < 0.001; 95% CI = 41.773, 66.192), and children of ESB skilled immigrants had not showed any differences (t(2711) = 0.04; d = 0.003; p = 0.99; 95% CI = -13.902, 13.499) compared to for children of native-born skilled parents. There was significant difference found between the numeracy scores for the two groups of second-generation immigrant children (t(342) = 7.3; d = 0.8; p<0.001; 95% CI = 36.414, 71.954).

4.8.2   Findings of children of NESB skilled immigrants at their 14 years of age

Overall results

The MANCOVA found there was an overall difference between the three groups in the outcome variables (F(6, 5224) = 27.0; partial η^2 = 0.030; p < 0.001).

Emotional and behavioural problems

No differences in emotional and behavioural problems found between the three groups of children (F(2, 2614) = 0.6; partial η^2 = 0.000; p = 0.57). The means for all groups fell within the normal range (Figure 4.4).

Figure 4-4: Mean scores on the *Strengths and Difficulties Questionnaire* (SDQ), and reading and numeracy tests from the *National Assessment Program— Literacy and Numeracy* (NAPLAN) for three groups of children

(a) Emotional and behabioral problems

(b) Reading and numeracy scores
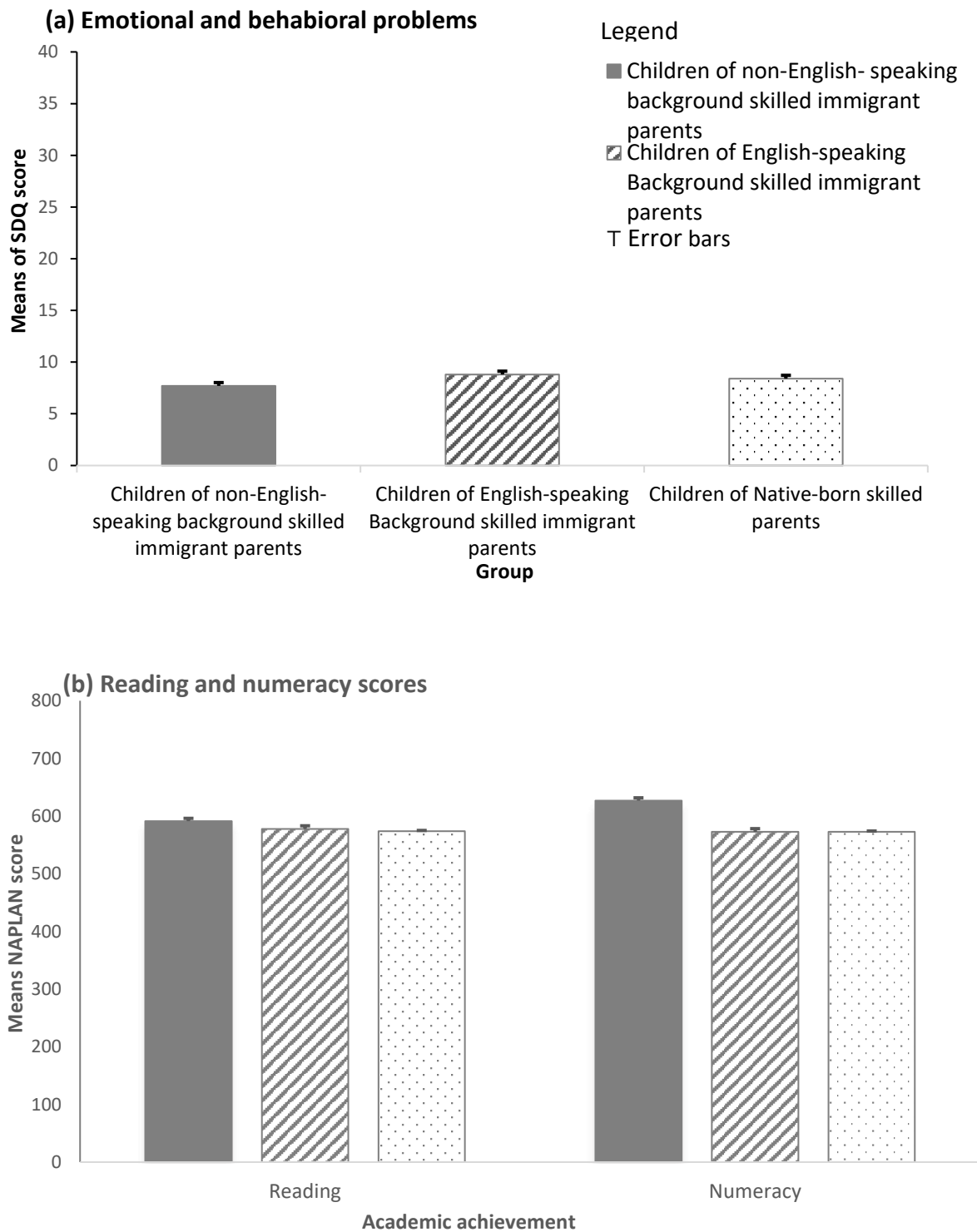
Academic achievement

Reading performance in English

Reading scores differed across the three groups (F(2, 2614) = 15.3; partial η^2 =.012; p < 0.001) (Figure 4.4). Post hoc tests showed that English reading scores for children of skilled immigrants from NESB were higher (t(2478) = 5.2; d = 0.4; p < 0.001; 95% CI = 13.635, 37.048), and children of skilled immigrants from NESB had not showed any differences (t(2440) = 2.3; d = 0.2; p = 0.07; 95% CI = -0.789, 25.45) compared to for children of native-born skilled parents. There was no difference between the reading scores for the two groups of second-generation immigrant children (t(312) = 1.8; d = 0.2; p = 0.20; 95% CI = -4.01, 30.032).

Numeracy performance

Numeracy scores differed across the three groups (F(2, 2614) = 71.3; partial η^2 = 0.052; p < 0.001) (Figure 4.4). Post hoc tests showed that numeracy scores for children of NESB immigrants were higher (t(2478) = 11.9; d = 0.9; p < 0.001; 95% CI = 48.402, 72.715), and children of ESB immigrants had not shown any difference (t(2440) = 1.1; d = 0.1; p = 0.82; 95% CI = -7.394, 19.853) compared to for children of native-born parents. There was significant difference found between the numeracy scores for the two groups of second-generation immigrant children (t(312) = 7.4; d = 0.8; p<0.001; 95% CI = 36.653, 72.004).

4.9 Discussion

This study's main focused was to examine the adaptation of emotional and behavioural problem and academic achievement in the reading and numeracy performance of children of NESB skilled immigrants in Australia. At first, this study explores the group differences by exploring the adaptation level of children of NESB immigrants compared to children of ESB skilled immigrants and children of native-born skilled parents at 10 years, 12 years, and 14 years of age. Moreover, this study examined the immigrant status effect and language effect on their adaptation levels on emotional and behavioural problems and academic achievement in reading and numeracy performance at all ages.

The findings of this study suggest that children of NESB immigrants exhibit a positive adaptation in emotional and behavioural health in Australia. To examine the group

differences, this study hypothesised that the level of emotional and behavioural problems among children of NESB immigrants would be lower compared to children of native-born skilled parents and children of ESB skilled immigrants at all ages. The study findings explored lower levels of emotional and behavioural problem scores among children of skilled immigrants from NESB compared to other two groups at 10 years, 12 years, and 14 years. Particularly, the groups' difference scores were not significant, which demonstrated similar levels of emotional of problems among the three groups. Subsequently, Australian-born all children show similar level of emotional and behavioural well-being no matter they are from immigrant background or native background. This study found no evidence of the immigrant disadvantage pattern that was reported in most previous research findings (e.g., Oppedal, & Røysamb, 2004; Motti-Stefanidi et al., 2011; Motti-Stefanidi et al., 2008). Children of NESB skilled immigrants did not display higher emotional and behavioural problems compared to non-immigrant children and children of ESB immigrants in Australia. This study did not examine the effect of immigrant status and language status on their emotional and behavioural problems further because of similar levels of psycho-social well-being was observed among the three groups.

It was hypothesised that the adaptation on academic achievement in reading performance among children of NESB immigrants would be higher compared to children of native-born skilled parents and children of ESB skilled immigrants at the age of 10 years, 12 years, and 14 years. The study results supported the hypothesis. Children of NESB immigrants displayed significantly higher scores in reading performance compared to the two other groups. This is consistent with other data (e.g., PISA; NAPLAN) on the performance of the children of immigrants in Australia (Akther & Robinson, 2014; Islam et al., 2022). In contrast, it was not consistent with previous research (e.g., Bodovski & Durham, 2010). In addition, in relation to the effect of immigrant status this study hypothesised that reading performance among children of skilled immigrants from NESB and ESB will be higher compared to children of native-born skilled parents. The results showed that children of NESB immigrants displayed significantly higher reading scores and children of ESB immigrants displayed similar reading scores compared to children of native-born immigrants. None of the second-generation immigrants group demonstrated lower academic scores or disadvantage in reading performance than the non-immigrant group

that was contrasting with previous research (e.g., Motti-Stefanidi et al., 2008). Furthermore, this study made another hypothesis to explore the effect of language status on academic achievement in reading performance. It was hypothesised that reading scores of second-generation children of immigrants from NESB would be higher than children of ESB immigrants. Children of NESB immigrants demonstrated higher scores in reading performance, however, this difference was not significant. Children from English-speaking countries might have better performance possibilities in reading due to higher host language proficiency and similar cultural backgrounds. The findings showed that both immigrant groups showed similar levels of reading performance. However, these findings contrast with previous research that showed a disadvantage for children of immigrants with limited proficiency in the host language (e.g., Toppelberg et al., 2010).

This study explored another adaptation area of children of NESB skilled immigrants, that was academic achievement in numeracy performance. This study was hypothesised that the level of numeracy performance among children of skilled immigrants from NESB would be higher compared to children of native-born skilled parents and children of ESB skilled immigrants. The study findings supported the hypothesis. Children of NESB immigrants demonstrated significantly higher academic scores in numeracy performance compared to children of native-born skilled parents and children of ESB immigrants at 10 years, 12 years, and 14 years of age. The finding was consistent with some previous research in Australia (e.g., Akther & Robinson, 2014; Islam et al., 2022). In contrast, it was not consistent with Bodovski and Durham's (2010) research where second-generation immigrant children showed a disadvantage. In addition, this study found no evidence of a negative immigrant status effect on academic achievement in numeracy performance. The hypothesis was supported by the findings. The hypothesis was "the level of numeracy performance of children of skilled immigrants from NESB and ESB would be higher than children of native-born skilled parents". Children of NESB skilled immigrants exhibited significantly higher academic scores in numeracy performance, and children of ESB skilled immigrants exhibiting similar academic scores in numeracy performance compared to children of native-born parents at 10 years, 12 years, and 14 years of age in Australia. To explore the language status effect, this study hypothesised that academic scores in numeracy performance among children of skilled immigrants from NESB would be higher

than children of skilled immigrants from ESB. The study results supported the hypothesis. Children of NESB immigrants unveiled higher academic scores in numeracy performance than children of ESB immigrants at all three ages. Children's heritage language other than English did not demonstrate any negative effects on academic achievement in numeracy performance of Australian-born children of NESB skilled immigrants.

This study suggests that children of skilled immigrants from NESB in Australia exhibit similar or better outcomes in all three areas of adaptation: emotional and behavioural problems, academic achievement in reading, and numeracy performance compared to children of native-born skilled parents and second-generation immigrant children of ESB immigrants at all three ages.

4.10 Strengths and limitations

This study depends on the sample size from the archival LSAC dataset which is available according to the selected groups and their inclusive criteria. Though the available samples size for the immigrant groups showed was challenge for this dataset, it is true that data collection was not possible from each Jurisdiction of Australia for a single researcher. In this context, the LSAC dataset is robust, and it represents a good opportunity to undertake a secondary analysis of nationally representative data.

Two cohorts of data were available in this selected dataset: The Baby and the Kindergarten Cohorts. Data from both Baby and Kindergarten Cohorts were integrated to maximise the sample sizes. The sample size was reduced again in the multivariate MANCOVA model samples size and due to some missingness in certain characteristics, which resulted in wider confidence intervals for some point estimates. Despite these limitations, the study's robust dataset allowed for nationally representative outcomes to be explored.

In addition, attrition analyses were conducted to explore, if there was any kind of bias in the result because of the magnitude of attrition; demographic bias, and poorer performance bias. The result did not show any biases in any criteria for any group except for the second-generation children of ESB skilled immigrants.

4.11 Conclusion

In summary, the lower levels of adaptation reported in studies of immigrant children in the USA and many European countries were not replicated in a nationally representative sample of Australian pre-adolescents to adolescent children of skilled immigrants. This is consistent with other data on the performance of children of immigrants in Australia. This was an exceptional finding compared to previous research which could be used as a guide for future research and has implications for policy and practice makers. Several factors concerning immigration policy and resettlement procedures may have contributed to this pattern of findings.

The findings of this study are quite different from studies of children of immigrants in the USA and countries from Western Europe. Data from Australia showed second-generation immigrant childrenare thriving, with no evidence of poorer outcomes at either age 10 years, 12 years, and 14 years of age on any outcome for the children of skilled immigrants. Similar findings were found for academic achievement in data from PISA and NAPLAN(e.g., Akther & Robinson, 2014; Islam et al., 2022). It is not clear if this pattern of findings is due to the unique context of Australia's selective migration policy (e.g., Entorf & Minoiu, 2005; Sakellariou, C., 2018) or multicultural policies and positive integration approaches (e.g., Marks et al., 2018), or if related to English-language support for students for whom English is a second language, well-established immigrant resettlement programs (e.g., New Arrivals Program; Adult Migrant English classes; Migrant Resource Centres), or other factors (e.g., Asian-American immigrant children showed positive outcomes) may be responsible for this distinct outcomes. Immigrant children's outcomes could be a combination of all those factors. Suárez-Orozco and Suárez-Orozco (2009) also found that children of immigrants who received support in their language development and cultural adjustment showed improvement in their academic performance.

The pattern of immigrant disadvantage was not observed in children of NESB immigrants. This might be due to the practice of multicultural policy and the strong support programs of immigrant settlement and the English language support program in Australia, or a combination of those. Overall, the findings of this study provide a unique perspective on the adaptation of children of immigrants in Australia and suggest that policies and

programs supporting immigrant resettlement, English language support, and multiculturalism in Australia may contribute to the positive outcomes observed in this study. However, further research is needed to explore the underlying mechanisms that contribute to the positive outcomes of NESB skilled immigrant children in Australia, and to understand skilled immigrants from NESB relative to children of skilled immigrants from ESB as well as the potential long-term outcomes of these groups, as well as the potential implications for policy and practice makers.

CHAPTER 5—STUDY TWO: LONGITUDINAL CHANGES IN ADAPTATION

Longitudinal changes of adaptation of emotional and behavioural problems and academic achievement in reading and numeracy performance of second-generation children of skilled immigrants from NESB

5.1 Overview

In the previous chapter from the cross-sectional analysis Study One explored the group differences on the adaptation of children of NESB immigrants, compared to children of ESB immigrants and native-born parents at their 10 years, 12 years, and 14 years of age. It explained children group differences and the level of adaptation on emotional and behavioural problems, and academic achievement in reading and numeracy performance at each individual ages. Consequently, the first study was not suitable to explore children's developmental changes of adaptation. Several studies have suggested that utilising longitudinal methods is important in obtaining a precise understanding of the nature and sources of developmental change (Magnusson & Cairns, 1996; Morrison & Ornstein, 1996; Magnusson & Stattin, 2006). The existing literature reveals a gap in research on the developmental changes or trajectory of second-generation children of skilled immigrants. There appears to be an absence of longitudinal studies specifically focused on the adaptation of second-generation immigrant children from NESB skilled immigrants. Acknowledging that gap this chapter introduces the longitudinal analysis for exploring the developmental changes on emotional and behavioural problems, and academic achievement in reading and numeracy performance of second-generation children of NESB skilled immigrants from the span of 10 years to two subsequent ages (12 years, and 14 years) in this second study.

Several longitudinal studies have been conducted to explore the patterns of adaptation among children of immigrants (E.g., Berry, 1997; Coll et al., 1996; Motti-Stefanidi et al., 2011). However, most of these studies have focused on either first-generation immigrants or a pooled samples of first- and second-generation immigrant children from mainly unskilled immigrant backgrounds, or a combination of skilled and unskilled

immigrant backgrounds. Given the considerable challenge that adapting to a new language other than the home language and cultural differences from their heritage backgrounds posed, no longitudinal research was found in the literature that concentrates on second-generation immigrant children from NESB skilled immigrants.

The complex process of immigration and the experiences of children of immigrants can have a notable impact on their emotional and behavioural well-being, as well as their academic achievement. Therefore, to gain a better understanding of the adaptation of children from NESB skilled immigrants, this study explored their longitudinal changes on emotional and behavioural problems, and academic achievement in reading and numeracy performance.

Emotional and behavioural well-being is an important facet of a child's development, irrespective of whether they were from immigrant backgrounds or native. Maintaining proper emotional and behavioural well-being is challenging for children of immigrants, as reported in longitudinal research that showed regardless of generation both first- and second-generation immigrant children reported more emotional and behavioural problems than non-immigrant groups (Stevens et al., 2015). The adaptation results of these studies may not be generalisable to children of NESB skilled immigrants. Understanding the longitudinal changes of adaptation in emotional and behavioural problems of this distinct group is critical to identifying potential areas for contribution and support, to increase immigrant children's well-being.

In addition, academic achievement is another fundamental aspect of a child's development. Successful completion of reading and numeracy performance is fundamental for academic success. Children from NESB skilled immigrant families may face challenges in developing favourable success on their reading and numeracy performance due to language barriers and cultural differences from their heritage context. Reardon and Galindo (2009) examined the academic achievement gap between Hispanic and White students in reading and numeracy performance from a longitudinal study, and the results showed a significant academic achievement gap between Hispanic and White students in both reading and numeracy and that the gap persisted across all grade levels. The gap was largest in upper grades among Hispanic rather than White students. Rosenbaum and Rochford (2008) used a

nationally representative sample from the National Education Longitudinal Study in the USA and their results showed that second-generation immigrant children had higher academic achievement than both first-generation immigrant children and other generations. This finding was different from many previous research findings. Rosenbaum and Rochford (2008) did not provide information on the heritage country background of the immigrant children in their study but focused on the variable effects of positive attitudes and social capital on academic performance on the generational patterns in academic achievement. Therefore, understanding the longitudinal changes in academic achievement in the reading and numeracy performance of children from NESB skilled immigrant families is critical to identifying potential areas of contribution and support for their academic success.

Most longitudinal research is based on mixed samples of first- and second-generation immigrant children from unskilled or pooled samples of unskilled and skilled immigrant backgrounds. The immigration contexts studied involve a wide range of host countries that have wide-ranging immigration, settlement, and social contexts, that lead to different emotional and behavioural problems and academic outcomes among immigrant children. For example, Entorf and Minoiu (2005) noted that in countries with selection migration policy such as Australia, Canada, and New Zealand, outcomes for immigrant children were similar or better than native-born children, due to the application of multicultural policy and funding of programs promoting multiculturalism, equity, and social justice. In valuing multiculturalism, Australia applies policy that supports the integration and settlement of immigrant families (e.g., Entorf & Minoiu., 2005). There is a possibility that Australian-born children of immigrants would show a positive or favourable longitudinal trend or changes in outcomes compared to many previous research findings. Therefore, the present study aimed to investigate the longitudinal changes in the adaptation of the emotional and behavioural problems and academic achievement in reading and numeracy performance of children of NESB skilled immigrants.

5.2   Research aims

Aim – I: To explore the longitudinal changes in the adaptation of emotional and behavioural problems among second-generation children of NESB skilled immigrants and compared to

the second-generation children of ESB skilled immigrants and children of native-born skilled parents at 10 years, 12 years, and 14 years of age.

Aim – II: To explore the longitudinal changes in the adaptation of academic achievements in reading and numeracy performance among second-generation children of NESB skilled immigrants and compared to the second-generation children of ESB skilled immigrants and children of native-born skilled parents at 10 years, 12 years, and 14 years of age.

5.3 Hypothesis

Hypothesis – I: The longitudinal changes of emotional and behavioural problems of children of NESB immigrants would be unfavourable or negative from 10 years to following two ages at 12 years and 14 years of age. Similar changes would be observed compared to the other two other groups: children of skilled immigrants from ESB and children of native-born skilled parents from 10 years to 12 years, and 14 years of age.

Hypothesis – II: The longitudinal changes of academic achievement in reading and numeracy performance of children of skilled immigrants from NESB would be higher/positive from 10 years to following two ages at 12 years and 14 years of age. Similar trends would be found in both academic skills of children of NESB immigrants compared to the other two counterparts: children of immigrants from ESB and children of native-born skilled parents from 10 years to 12 years, and 14 years of age.

5.4 Methods

5.1.1 Datasets

Longitudinal data were extracted from two Australian nationally representative archival data sets: LSAC and NAPLAN. Data for emotional and behavioural problems were collected as part of the LSAC, while data for children's academic achievement in reading and numeracy performance were collected as part of the NAPLAN datasets which were linked with the LSAC dataset. Details of both data sets were discussed the methodology chapter and in the previous chapter in Study One (Chapter 2 and Chapter 4).

5.1.2 Participants

Participants were selected from LSAC data who responded consecutively at 10 years, 12 years, and 14 years of age. Similar to the participants of Study One, this study included Australian-born children in all three age groups. The criteria of selected participants for these groups were the same as in Study One (Chapter 4). The details of the number of participants and their characteristics are shown in Table 5.1.

In total, there were 178 children from NESB immigrants, while there were 129 children from ESB immigrants, and 2416 children of native-born parents. Male children were relatively higher in the ESB immigrants (55%) compared to their counterparts (51.1 % of children from NESB immigrants, and 50.2 % of children from native-born parents). The mean ages and standard deviations (SDs) for the three age groups were almost the same among the three groups. Parental educational level was recorded when the children aged 10 years. More than 55% of parents completed their Bachelor or advanced diploma or diploma education in all three groups, followed by postgraduate or graduate diploma (32-35%), and certificate or other level of education (5-11%). The postgraduate/graduate diploma or Bachelor/advanced diploma/diploma levels of education were similar in NESB immigrants and Native-born parents, whereas those with ESB immigrants had higher education levels compared to the other two groups. In contrast, ESB immigrants had a lower level of certificate or other education (6.5%) compared to the other two groups (11.1% percent for NESB immigrant parents and 12.1% for Native-born parents). The parent's country of origin was listed by three groups of children in the same table. The NESB immigrant parents migrated from different NESB countries (e.g., China, India, Sri Lanka, Viet Nam, and Malaysia), whereas ESB skilled immigrants' parents from various ESB countries (e.g., England, New Zealand, USA). The native-born parents were citizens of Australia.

Table 5.1: Selected participants in three groups of children.

Australian-born children of skilled parents	n 10, 12 and 14 years	Gender Male (%) 10, 12 and 14 years	Age (years)						(P1) Parental education* (%)			Parent's country of origin
			10		12		14		Postgraduate & graduate diploma	Bachelor & advanced diploma, diploma	Certificate and other	
			m	SD	m	SD	m	SD				
Non-English-speaking immigrants	178	51.1	10.3	0.5	12.4	0.5	14.3	0.5	32.4	56.5	11.1	China (excludes SARs and Taiwan), India, Sri Lanka, Viet Nam, and Malaysia etc.
English-speaking skilled immigrants	129	55.0	10.3	0.5	12.4	0.5	14.4	0.5	35.5	58.0	6.5	England, New Zealand, and USA etc.
Native-born parent	2416	50.2	10.4	0.5	12.4	0.5	14.4	0.5	32.1	55.8	12.1	Australia

Note: Same children were selected in three ages and parental education level were listed only when children were at their 10 years.

5.5 Measurements of outcome variables

The Strength and Difficulties Questionnaire (SDQ) (Goodman, 1997) was used in the LSAC to measure the emotional and behavioural problems of children at different ages. Academic achievement scores were extracted from NAPLAN data sets to assess the children's academic achievement in reading and numeracy performance. Details of both measurements were discussed elaborately in the previous chapter (Chapter 4, Study 1).

5.6 Analysis plan

Data management and statistical analyses were performed using the IBM Statistical Package for Social Sciences version 25 (SPSS; IBM Corp, 2017) and Stata software version 16.1 (StataCorp, 2019). Descriptive statistics were used to assess the level of longitudinal emotional and behavioural problems and academic achievement in reading and numeracy of children of immigrants from NESB and immigrants from ESB than children of native-born parents. A multivariate mixed effect linear regression model was applied to fit linear mixed models to examine the emotional and behavioural problems, and academic achievement scores between children's groups over 10, 12, and 14 years of age. As the outcome occurs for each child with repeated time points, the mixed effect models captured both fixed effects and random effects within the hierarchical structure of the data. The fixed effects, including group effect, age effect, and group x age interaction, were analogous to the regression coefficients. The random effects represent the estimated variability in the intercept to account for repeated measurements. The models were adjusted by their gender to reduce the confounding bias. This is because, there was a heterogeneity of outcomes between male and female children in three-time frames. The two-sided test performed for all analyses and the level of significance was set at 0.05. Additionally, post hoc t-tests with Bonferroni correction were performed to identify which groups significantly differed from each other.

Attrition analysis was conducted to explore the magnitude of attrition, changes in three demographic variables (child gender; single parent household; socio-economically disadvantaged neighbourhood), and performance bias for interpretation of this longitudinal study findings (details in Chapter 3).

5.7 Results

5.7.1 Longitudinal outcomes and changing pattern (within group comparison and between-group comparisons)

This section aimed to examine whether the outcomes varied in the following two ages compared to 10 years in a longitudinal pattern. To explore the net change of outcome scores among the children's groups, between-group comparisons were examined. Table 5.2 shows the longitudinal pattern and changes of three outcome measures for children of NESB immigrants, ESB immigrants, and children of native-born parents in three age ranges. Figure 5.1 depicted the estimated mean scores and 95% CI from the mixed effect modelling to examine the pattern of emotional and behavioural problems, and academic achievement scores between children's groups over 10 years, 12 years, and 14 years of age. Details results for each outcome were discussed below.

Emotional and behavioural problems – within group comparison

The mean scores of emotional and behavioural problems for children of NESB immigrants were substantially decreased from 8.53 at age 10 years to 7.72 at age 12 years, a mean reduction of 0.81 (95% CI -1.61, -0.01; p = 0.048). In contrast, at age 14, the mean score for this group increased to 9.16, a mean increase of 0.63 (95% CI -0.17, 1.43; p = 0.13) (Table 5.3, Figure 5.1a). However, the increment was not significant between these two-age groups. The attrition remained unaffected for this increment, as the number of children in both the 12 years and 14 years age groups was nearly identical (see Table 3.5 from Chapter 3). This increment can be attributed to possible challenges linked with physical changes (onset of puberty); emotional challenges (mental health problems appear more prominent in adolescent ages) and challenges related to their identity development (this challenge is stronger among children of immigrants). Although not significant, similar trends were observed within children of ESB immigrants (change = -0.30, 95% CI -1.24, 0.65, p = 0.54 at age 12 years; change = 0.40, 95% CI -0.55, 1.34, p = 0.41 at age 14 years). The mean emotional and behavioural problems scores for children of native-born parents were comparatively more decreased at 12 years than the other two groups, a mean reduction of 1.03 (95% CI -1.25, -0.81, p<0.001) from 9.43 at age 10 years to 8.40 at 12 years. The emotional and behavioural problems scores then increased to 9.50 at age 14 years from

9.43 at age 10 years (0.06, 95% CI - 0.16, 0.28, p = 0.57). Overall, the mean score of emotional and behavioural problems was observed below the borderline (scores 16 – 19) and clinical cut points (scores 20 – 40) among all three groups at all ages (Figure 5.1a). The results displayed a favourable trend on the improvement of emotional and behavioural well-being within children of skilled immigrants from NESB over the span of 10 years to subsequent ages (12 years and 14 years).

Emotional and behavioural problems – between group comparison

When comparing groups, there was only a small difference in the change scores of emotional and behavioural problems between children of NESB and ESB immigrant parents at ages 12 years (0.51, 95% CI 0.72, 1.75, p=0.42) and 14 years (-0.23, 95% CI -1.47, 1.01, p=0.71). Emotional and behavioural problem scores for children of NESB immigrants at 12 years were rapid change, but slow change for children of ESB skilled immigrants, resulted in 0.51 change. But the opposite direction at 14 years. There were no significant differences in emotional and behavioural problem scores between children of NESB skilled immigrants and children native-born skilled parents at any ages. This was observed both at 12 years (-0.22, 95% CI 1.05, 0.61, p = 0.60) and at 14 years of age (- 0.56, 95% CI -1.40, 0.27, p = 0.18). In summary, the findings of this study clearly showed that the children of NESB immigrants in Australia showed positive or favourable longitudinal changes in terms of emotional and behavioural outcomes.

Academic achievement in reading skills – within group comparison

Based on longitudinal findings, a consistently positive developmental trajectory observed in the reading skills of children across all three groups of children. This implies that regardless of their backgrounds, all the children showed an improvement in their academic achievement in reading performance at all ages (Table 5.2, Figure 5.1b). When comparing the group of children within NESB skilled immigrants, the mean score for their reading performance was 550.35 at the age of 10 years. This score showed a significant increase of 42.37 points by the age of 12 years (95% CI 34.45, 50.29; p<.001), and then it increased substantially again by 86.12 points by the age of 14 years (95% CI 78.19, 94.15; p<.001). This indicates an improvement in the reading skills of children of NESB immigrants over ages. The developmental trends in the academic achievement of reading performance were observed

to be similar between children of ESB immigrants and children of native-born parents. Furthermore, the mean scores of academic achievements in reading performance for all three groups of children were higher than the national average mean score or band score at all three ages. This suggests that the reading performance of these children were above national average reading scores (national reading average score was 384.8 – 420.1 for Grade 5; 431.7 - 472.0 for Grade 7; and 485.5 - 528.7 for Grade 9) y (Figure 5.1b). Overall, children of NESB immigrants demonstrated favourable trend on longitudinal changes on their reading performances from 10 years to 12 years, and 14 years of age.

Academic achievement in reading skills – between group comparison

Table 5.2 indicates that when comparing the three groups, children of NESB immigrants performed better in reading performance than the other two groups. However, the improvements in reading performance between the groups were not statistically significant. In a comparison of between-groups differences at 12 and 14 years of age, there were no significant differences in reading skill scores among children of NESB skilled immigrants compared to children of ESB skilled immigrants and children of native-born skilled parents. Their academic achievement in reading performance was similar to the other two groups. For example, a small difference of 2.85 (95% CI -9.48, 15.17, p = 0.65) at years 12 and 2.63 (95% CI 15.04, 9.79; p = 0.68) at years 14 was found between children of NESB and ESB immigrants. Similar differences were found between children of NESB immigrants and native-born parents at 12 years (- 1.28, 95% CI 9.49, 6.93), however, a relatively higher, but not significant at 14 years (-7.91, 95% CI -16.2, 0.36; p = 0.06). In conclusion, children of NESB immigrants demonstrated similar result on reading performances years compared to two other groups over the span of 10 years to subsequent ages of 12 years and 14 years.

Academic achievement in numeracy skills- within group comparison

The academic achievement scores in numeracy performance were comparatively higher than academic achievement scores in reading performance for children of NESB immigrants in all three ages. However, the scores were almost similar for children of ESB immigrants and children of native-born parents. Nevertheless, the rate of change of the improvements in numeracy performance was statistically significant between ages across three groups (Table 5.2, Figure 5.1c). For example, the mean score of numeracy

performance for children of NESB skilled immigrants were significantly increased by 68.6 points from 564.5 at age 10 years to 633.1 at age 12 years (95% CI 61.9, 75.3, p<0.001). An increment was even higher at age 14 years from 564.5 at age 10 years to 680 at age 14 years, a mean improvement was 115.5 (95% CI 108.8, 122.2, p<0.001). Similar trends were observed within the group of children of ESB immigrant parents and native-born parents. In summary, children of NESB skilled immigrants demonstrated a favourable trend on the longitudinal changes on academic achievement in numeracy performance from 10 years to two following aged 12 years and 14 years.

Academic achievement in numeracy skills - between group comparison

When comparing the mean scores of academic achievements in numeracy skills among all three groups, children were found to be above the national average band score (national average score was 379.2 – 419.4 for Grade 5; 428.9 –475.1 for Grade 7; and 479.4 – 526.1 for Grade 9) at all three ages Table 5.3, (Figure 5.1c). Table 5.3 showed that children of NESB immigrants performed better in numeracy performance compared to children of ESB immigrants and children of native-born parents. Significant positive improvements were found among children of NESB immigrants compared to children of native-born parents at 12 years (-12.6, 95% CI -19.54, -5.68; p<0.001) and 14 years (-15.2, 95% CI -22.16, -8.23; p<0.001). However, there were no significant changes observed between children of NESB and ESB immigrants at 12 years (-7.47, 95% CI 17.79, 2.86) as well as 14 years (-6.85, 95% CI 17.25, 3.56). In summary, the results indicated that the children of NESB immigrants in Australia showed positive or favourable trend on longitudinal changes of adaptation in terms of academic achievement in numeracy performance.

Table 5.2: *Longitudinal outcomes and changing pattern of three children's groups in three ages.*

Outcomes and Australian-born children of skilled parents	Age			Within-group effect		Between-time-group effect			
	10 years	12 years	14 years	12 years versus 10 years (95% CI)	14 years versus 10 years (95% CI)	Differences at 12 years (95% CI)	p	Differences at 14 years (95% CI)	p
Emotional and behavioural problems									
Non-English-speaking immigrants' parent	8.53	7.72	9.16	- 0.81 (-1.61, - 0.01) *	0.63 (- 0.17, 1.43)				
English-speaking immigrants' parent	9.17	8.87	9.57	- 0.30 (-1.24, 0.65)	0.40 (- 0.55, 1.34)	0.51 (-0.72, 1.75)	0.42	- 0.23 (- 1.47, 1.01)	0.71
Native-born parent	9.43	8.40	9.50	-1.03 (- 1.25, -0.81) ***	0.06 (- 0.16, 0.28)	- 0.22 (-1.05, 0.61)	0.60	- 0.56 (- 1.40, 0.27)	0.18
Academic achievement in reading									
Non-English-speaking immigrants' parent	550.35	592.71	636.50	42.37 (34.45, 50.29) ***	86.17 (78.19, 94.15) ***				

English-speaking immigrants' parent	535.18	580.39	618.69	45.22 (35.78, 54.67) ***	83.54 (74.03, 93.05) ***	2.85 (- 9.48, 15.17)	0.65	- 2.63 (-15.04, 9.79)	0.68
Native-born parent	534.51	575.60	612.77	41.09 (38.93, 43.26) ***	78.26 (76.07, 80.44) ***	- 1.28 (-9.49, 6.93)	0.76	- 7.91 (-16.19, 0.36)	0.06
Academic achievement in numeracy									
Non-English-speaking immigrants' parent	564.51	633.10	680.00	68.59 (61.91, 75.28) ***	115.50 (108.78, 122.21) ***				
English-speaking immigrants' parent	514.23	575.36	622.88	61.13 (53.26, 69.00) ***	108.65 (100.70, 116.60) ***	- 7.47 (- 17.79, 2.86)	0.16	- 6.85 (-17.25, 3.56)	0.20
Native-born parent	518.17	574.15	618.47	55.99 (54.16, 57.81) ***	100.30 (98.46, 102.14) ***	-12.61 (- 19.54, -5.68)	<0.001	-15.20 (-22.16, -8.23)	<0.001

Figure 5.1: Overall longitudinal changes in longitudinal outcomes (a. emotional and behavioural problems; b. reading score; and c. numeracy score) of Children of NESB skilled immigrants compared to the other two groups in three different ages

(a) Emotional and behavioral problems of children

(b) Reading score of children

(c) Numeracy score of children
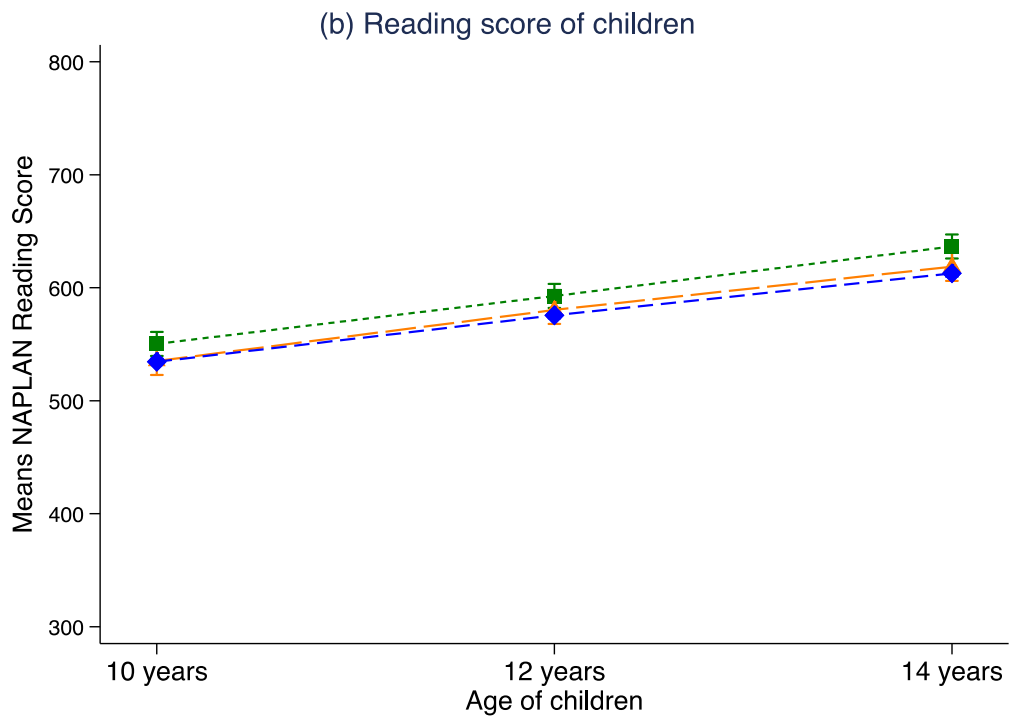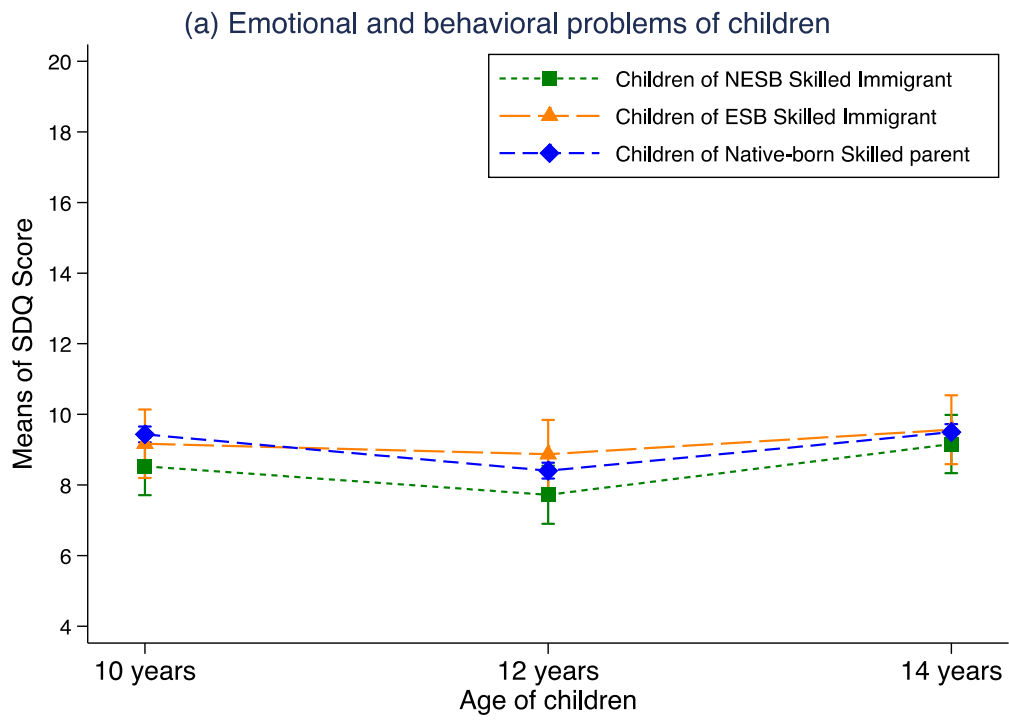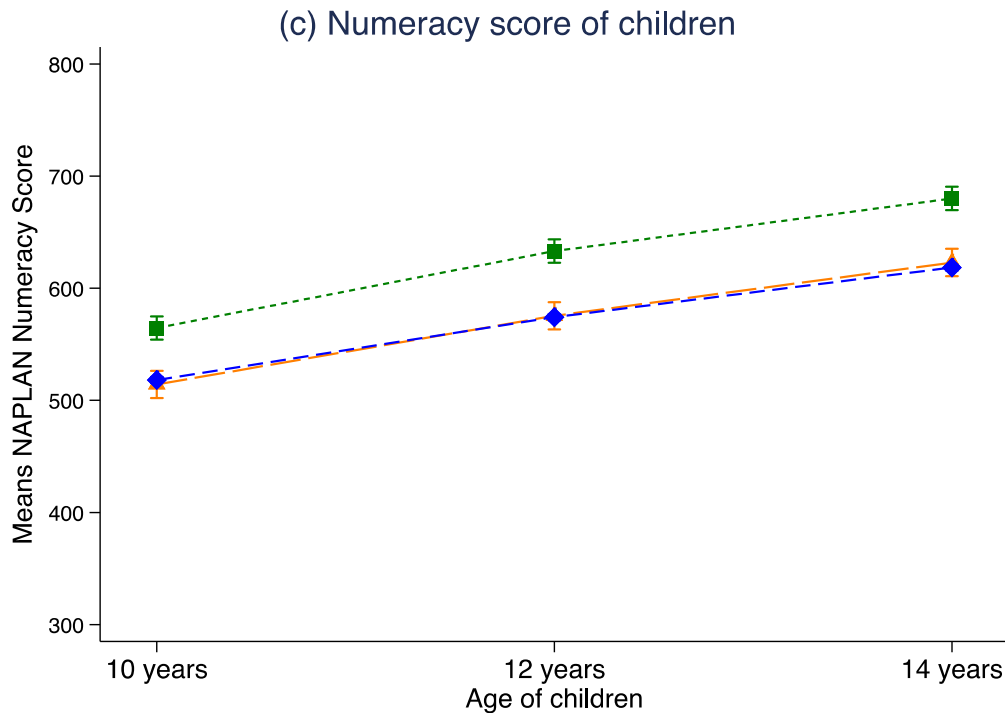
5.8   Discussion

The findings of this study clearly showed that children of skilled immigrants from NESB in Australia showed a positive longitudinal pattern of adaptation in terms of both emotional and behavioural well-being and academic achievement in reading and numeracy performance. This is consistent with other data on the performance of children of immigrants in Australia, Canada, and New Zealand (e.g., data from PISA, OECD., 2013). However, it is not consistent with the evidence of the immigrant disadvantage reported in previous longitudinal research in other countries (e.g., Coll & Marks., 2012; Marks et al., 2014). While differences exist in comparison to previous research, the current study is the first longitudinal research, that focussed distinctively on the adaptation of second-generation children of skilled immigrants from NESB. The immigrant status did not show any negative evidence in longitudinal changes in all three outcomes of children of NESB immigrants. The findings reveal that children of NESB immigrants showed a slightly lower level of emotional and behavioural problems compared to children of native-born parents and children of ESB immigrants across all three ages. However, this difference was not significantly pronounced, indicating that all three groups showed a similar level of emotional

and behavioural problems. In addition, mean scores of emotional and behavioural problems for all three groups were below the borderline and clinical cut points at ages 10, 12, and 14 years. Their changes trend of the level of emotional and behavioural problems within groups were similar in all three ages.

Academic achievement in reading performance among children of skilled immigrants from NESB was higher or equal to those of the children of ESB immigrants and children of native-born parents in all three ages. In addition, changes in the longitudinal pattern on the developmental trajectory of the level of academic achievements in reading performance among children of NESB immigrants were similar in the base period compared to the children of ESB immigrants and children of native-born parents. The average academic scores for the three groups in reading performance was above the national minimum standard band for all ages. Similar findings were found for academic skills in the data from PISA (OECD, 2013) and research among Asian-American communities (Bodovski & Durham, 2010), but those studies were not longitudinal. Subsequently, children of NESB skilled immigrant shows positive adaptation in reading and numeracy performance and it remain their developmental trajectory in Australia.

The longitudinal changes on academic achievement in numeracy performance demonstrated a favourable trend from 10 years to 12 years, and 14 years of age. In particular they have displayed higher scores on numeracy performance from 10 years to 12 years, and 14 years of age. Moreover, they have showed similar or higher levels of scores on numeracy performance through a group comparison comprising children of native-born parents and children of ESB immigrants from 10 years to 12 years, and 14 years of age. The outcome supported the hypothesis. In contrast, most previous research found that children of immigrants were at a substantial academic disadvantage compared to non-immigrant children (Dustmann et al., 2012; Motti-Stefanidi et al., 2015; Thomas, 2009; Schnell & Azzolini, 2015). This research was not longitudinal and did not focus on specifically second-generation immigrant children from skilled backgrounds. Furthermore, previous research showed that highly acculturated second-generation immigrant children have poorer outcomes than first-generation immigrant children) (e.g., Marks et al., 2014), which is marked contrast with this study findings. Overall, Study Two's findings have shown that the

children of NESB immigrants in Australia showed positive longitudinal changes of adaptation in terms of academic achievement in numeracy performance.

In all three outcomes, children of skilled immigrants from NESB and ESB showed no differences in any subsequent ages from aged 10 years to 12, and 14 years. The moderate statistical power of two immigrants group combination have possibility to impact to observe the null differences among these two-immigrant group. Furthermore, the over-representation of male gender and single-parent household frond from attrition analysis among children of ESB immigrants in later ages did not influence on all three outcomes of the two immigrant children group combination. In numeracy performance, children of skilled immigrants from NESB showed the better performance or favourable changes compared to children of native-born skilled parent in two subsequent ages from aged 10 years to 12,and 14 years. Children of NESB immigrants showed similar outcomes in emotional and behavioural problems and better outcomes in both academic achievements in reading and numeracy performance compared to the children of ESB immigrants at their longitudinal trajectory. Similar findings were found that children of NESB immigrants showed similar or better in all three outcomes compared to the children of native-born parents at their longitudinal trajectory. Attrition in following ages did not impact on the longitudinal outcomes. The higher statistical power of these two children group would have contributed these findings. However, more research is needed to fully understand the complex and multifaceted experiences of these distinct groups of children.

5.9   Strengths and limitations

Similar to Study 1, the sample size in this study relied on the availability of data from the LSAC archival dataset, as per the specific inclusion criteria for each group. However, the number of samples in this study is even smaller compared to cross-sectional study due to the longitudinal nature of the study. Participants were chosen based on their presence or availability at each year level. While the number of available samples for this study was smaller, specifically for ESB children of immigrants, it was not feasible for a single researcher to gather data from every State in Australia. In this context, this dataset used in this study is robust and provides a significant opportunity to observe nationally representative outcomes for this distinct group.

Power calculations were conducted to see the sample size and power of this study, which showed sufficient power between children of NESB immigrants and children of native-born parents, as well as between children of ESB immigrants and children of native-born parents. However, the power was moderate between children of NESB immigrants and children of ESB immigrants. Since the primary focus of this study was on children of NESB immigrants and the between-group comparisons related to this particular group, and since there was an adequate statistical power for these comparisons, the study did not face a risk of bias stemming from attrition magnitude compared to children of native-born parents.

This thesis strengthened its credibility by conducting an attrition analysis, which was documented in Chapter 3. The attrition analysis was performed to evaluate any potential bias in the study's results. The analysis examined the magnitude of attrition, and demographic representation to identify any biases in the samples and demographic changes among different age groups. The analysis assessed the potential for performance bias due to sample attrition. The analysis found that the magnitude rate of attrition was smaller for children of native-born parents than children of NESB immigrants and children of ESB immigrants who experienced a higher rate of attrition. The analysis revealed that there were no significant differential changes in the three demographic variables of child gender, single-parent household, and socio-economically disadvantaged neighbourhood, which could potentially create differential bias across the three groups in both cohorts. The only exception from this pattern was observed in the case of children of skilled immigrants from ESB at specific time points. The detail discussion can be found in the attrition chapter (Chapter 3). Furthermore, the results of the attrition analysis provided reassurance that performance bias did not impact the longitudinal trajectory analysis for all three outcome measures across all groups of children, except for children of skilled ESB immigrants.

5.10 Conclusion

The lower levels of adaptation reported in studies of children of immigrants in the USA and many European countries were not replicated in a nationally representative sample of Australian-born children of skilled immigrants at their longitudinal trajectory or trend. Indeed, these data showed children of skilled immigrants from NESB were thriving, with no evidence of poorer outcomes on any outcome. It is not clear if this pattern of findings is due

to the unique context in Australia's selective migration policy (e.g., Entorf & Minoiu, 2005; Sakellariou, 2018), multicultural policies and a positive integration approach (e.g., Marks et al., 2018); English language support for students for whom English is a second language; well-established immigrant resettlement programs (e.g., New Arrivals Program; Adult Migrant English classes; Migrant Resource Centres) or combination of all those factors. Suárez-Orozco and Suárez-Orozco (2009) found that immigrant children who received support in their language development and cultural adjustment showed improvement in their academic performance. The pattern of immigrant disadvantage was not observed in the longitudinal trajectory of children of NESB skilled immigrants. In conclusion, children of NESB skilled immigrants did not have disadvantages like previous research in other traditional immigrant countries. This was reflected in their longitudinal developmental trend. There was a limitation while conducting this study, three groups were not had a similar number of samples and two immigrant groups were a much lower number of samples than the native group which was common in research in children of immigrants. Despite this limitation, this study was conducted on a distinct group, and it revealed an important exception to previous research findings and add a new knowledge in this field which has considerable potential for future research, policy, and practice implication.

CHAPTER 6 — STUDY THREE: INFLUENCED PREDICTORS OF EMOTIONAL AND BEHAVIOURAL PROBLEMS

6.1 Overview

The group differences were observed in cross-sectional Study One (Chapter 4) to explore the emotional and behavioural problems among children of immigrants and native-born parents in the Australian context. The emotional and behavioural problems were lower (or similar) for children of NESB skilled immigrants compared to children of native-born parents and children of ESB skilled immigrants. However, these outcomes were not the same for each child within the group of children of NESB immigrants. Some children have shown higher scores of emotional and behavioural problems and belong to the top quartile like children of native-born skilledparents and children of skilled immigrants from ESB. According to the findings of the cross-sectional study 6.8% children had shown higher emotional and behavioural problems as compared to children of native-born parents and 13.4% as compared to children of ESB immigrants. Consequently, there was a considerable variability in the outcomes of children of skilled immigrants from NESB. This variability can occur for several reasons, and it's often influenced by a combination of individual, familial, and societal factors. In this study, several factors were identified that could anticipate individual variances in emotional and behavioural problems among children of NESB immigrants. This investigation was guided by the well-known framework "The Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012). The framework was applied to mixed sample pools of first- and second-generation children of skilled, and unskilled immigrants. This framework developed In Greece, in locations in which most immigrants come from two backgrounds (Albania and "Pontian Greek") and a large number of children are from unskilled immigrant backgrounds. The extent to which the framework applies to second-generation children of skilled immigrants and the extent to which the framework is applicable in countries with a multi-cultural selective immigration policy is therefore unclear. The details of this framework can be found in Chapter One.

6.2 Selecting predictors associated children emotional and behavioural problems

This study was aimed to assess the applicability of this framework in this new group where children were distinctly second-generation, non-English speaking country backgrounds, and skilled immigrant backgrounds. Previous research guided the selection of predictors for emotional and behavioural problems at the interaction and child levels of Motti-Stefanidi et al.'s (2012) "Immigrant Youth Adaptation in Context" framework. The framework suggests that the predictors at the societal level have their influence on adaptation via their influence on predictors at the interaction and individual child levels.

The interaction level of the framework encompasses both familial and extra-familial contexts. Predictors associated with the home and family consistently made a significant contribution to the emotional and behavioural problems of children. No matter whether these children were from the immigrants or native backgrounds or different generation backgrounds. Parent's mental health and family characteristics impact on children of immigrant internalising problems (Lara-Cinisomo et al., 2013). Factors that were negatively associated with these problems include mothers' regulation of their own psychological health (Daga et al., 2015), observed family reframing and family problem-solving (Santiago et al., 2020). Previous studies showed that family integrity and traditional family values may buffer the negative impact of greater stressor exposure among immigrants and second-generation immigrant children when compared with third-generation adolescents (Cervantes et al., 2013). Parental school involvement (resources) was associated with immigrant status and social adversity (risks) in their individual level of adaptation and well-being (Motti-Stefanidi, F., Asendorpf, & Masten, 2012). The current Study focused on the primary caregiver's mental health to measure individual differences on emotional and behavioural problems of selected children.

Contexts outside the home have also been shown to influence on emotional and behaviour problems of the children of immigrants. Discrimination is a strong predictor of emotional and behavioural problems of children of immigrants (e.g., Guerra et al., 2019; Marks et al., 2018). Discrimination refers to the negative reaction based on factors such as diverse cultures, skin colour, religion, language, disability, and so on. Children of immigrant

face an increased likelihood of experiencing discrimination (Musso et al., 2015), and their perception of discrimination is associated with poor mental health, alcohol abuse and aggression (Nakash et al., 2012; Walsh et al., 2014; Walsh et al., 2018). Peer groups also play an important role in children's adaptation. Positive peer- relationships in both the host and heritage groups support the emotional well-being of children of immigrants (Motti-Stefanidi et al., 2020; Teja & Schonert-Reichl, 2013). However, previous research indicates that children of immigrants often experience a higher level of peer victimisation, including racist, physical, and sexual victimization, than their native-born peers (e.g., Stevens et al., 2015; Strohmeier et al., 2011). Positive teacher-child relationships were negatively associated with children's emotional and behavioural problems (Roorda & Koomen, 2020). A lower density of immigrant students in a school is associated with an increased chance of experiencing bullying (Hjern et al., 2013). Children's heritage country context plays a pivotal role in influencing their psychosocial well-being. For example, ethnic identity was associated with lower levels of withdrawn/depressed symptoms among both Latino and Asian children (Rogers-Sirin, & Gupta, 2012). Commonly social capital and a co-ethnic presence were protective factors against behavioural problems such as alcohol use and problem behaviours (Eitle et al., 2009). This study chosen positive teacher-child relationship, perceived discrimination, and peer victimisation predictors for extra-familial predictors at the interaction level.

Child characteristics have also been identified as predictors of children of immigrants emotional and behavioural problems. Child characteristics negatively associated with psychological well-being among children from immigrant backgrounds include female gender (Nakash et al., 2012).

The predictors related child's characteristics were one of the significant predictors to explain the emotional and behavioural problems of immigrant children. There was a positive correlation between greater self-efficacy in children of immigrants and their level of psychological well-being (Motti-Stefanidi, Asendorpf, & Masten, 2012). Individual factors such as lower self-esteem was strongly associated with psychosocial problems in children of immigrants (Nakash et al., 2012). Children with a high level of attitudinal familism were associated with fewer mental health symptoms (Li, 2014). Among child's various attributes, being female has been found to have a negative association with the psychological well-

being of children from immigrant backgrounds (Nakash et al., 2012). The current study would focus on their self-esteem and reactivity (irritable temperament).

Most current research is executed in the USA and Europe. Furthermore, the majority of the previous studies were based on first-generation immigrant children or pooled samples of first- and second-generation children of mainly unskilled immigrants. The findings were not separated according to the group to their parent's home origin language, such as English and non-English language backgrounds. Consequently, it was unknown the predictors will explain the individual differences on emotional and behavioural problems of second-generation children of skilled immigrants from NESB in Australia where a selection migration policy and immigrant settlement support programs have followed. To acknowledging this gap, this study selects the predictors for emotional and behavioural problems from previous research at the interaction and child levels of Motti-Stefanidi et al.'s (2012) "Immigrant Youth Adaptation in Context" framework. Figure 6.1 summarizes the predictors that were included in the current application of the "Immigrant Youth Adaptation in Context" framework for understanding individual differences of emotional and behavioural problems of children of NESB skilled immigrants.

Figure 6-1: Research model showing interaction and individual-level predictors of individual differences in emotional and behavioural problems among children of immigrants from non-English-speaking background (inspired by Motti-Stefanidi et al., 2012).
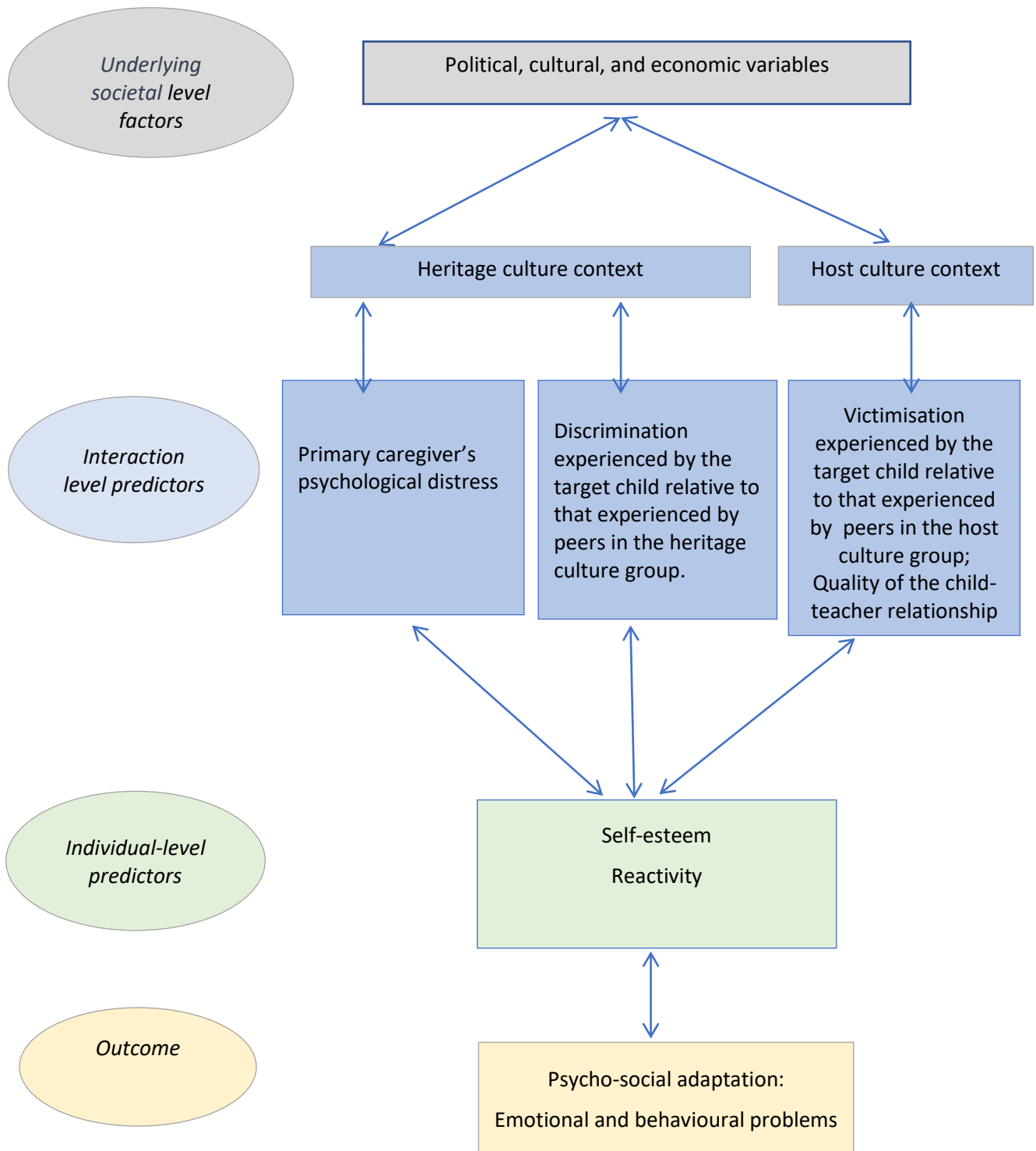
Research aims

1. To identify the predictors that account for individual differences in emotional and behavioural problems among Australian-born immigrant children of NESB skilled immigrants at 12 years.
2. To test the applicability of the theoretical framework the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) to the second-generation children of NESB skilled immigrants to Australia, as adapted for the current study.

6.3   Research hypothesis

1. Children of skilled immigrants emotional and behavioural problems would be negatively correlated with

- the quality of their relationship with their main teacher
- their self-esteem.

2. Children emotional and behavioural problems would be positively correlated with

- their primary caregivers' level of psychological distress
- the level of discrimination experienced by the child relative to that experienced by peers belonging to their heritage group
- the level of peer victimisation experienced by the child relative to that experienced by peers belonging to the host group
- their reactivity.

3. The research model depicted in Figure 6.1 will explain the significant amount of variance in children's emotional and behavioural problems.

6.4   Methodology

The current study was focused on the emotional and behavioural problems among children of NESB immigrants in Australia. Children were chosen at developmentally transitional age, from primary school to secondary school at 12 years. At this age, emotional and behavioural problems are more likely to manifest due to many changes during

adolescence, e.g., physical hormonal changes (puberty), the transition from primary school to secondary school, development of self-identity, friendship, or peer networks, etc.

This study used the same archival database, the Longitudinal Study of Australian Children (LSAC). The dataset was described briefly again in this study to review the design, samples, waves, and children's group. All the selected predictors were based on the availability of this dataset according to previous research and the theoretical guidelines.

6.4.1 Database: The Longitudinal Study of Australian Children (LSAC)

Data were extracted from the Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC) archival data set. This data set was the Australian first nationally representative longitudinal study to explore child development. This study was inaugurated with two cohorts. Baby Cohort comprised children aged 0 to 1 year in 2004 and the Kindergarten Cohort included 4 to 5 years of children in the same year. Both cohorts included 5,000 children. Every two years, children and their families have been visited by the LSAC research team, and data were collected from children, parents, families, communities, and their school characteristics that influence children's different areas of development at their different ages.

Samples were selected randomly from all Australian states and territories except the most remote areas to increase the representativeness of Australia. Data were collected in many ways; face-to-face interviews, direct assessments of the children, computer-assisted self-interview, and paper questionnaires. The Department of Social Services (DSS), the Australian Institute of Family Studies (AIFS), and the Australian Bureau of Statistics (ABS) have conducted this study in their partnership.

The data have been collected in Baby and Kindergarten cohorts in nine waves since 2004. This study extracted data from the LSAC database for children when they were 12 years of age, which was available at wave 7 in the Baby Cohort and wave 5 in Kindergarten Cohort.

The majority of studies concerning children of immigrants rely on convenience data, primarily because it is not feasible for an individual researcher to gather nationally representative sample. The LSAC is a nationally representative dataset that fulfils the entire

data required for this study aims. This dataset comprised multidimensional areas of understanding a child's developmental context, which appropriately enables the aim and objective of this study to be achieved.

6.4.2 Participants

This study used archival data from the LSAC, the most representative available data for the Australian children. Participants were selected from both Baby and Kindergarten Cohorts of children of NESB skilled immigrants at their transition from primary school to secondary school at aged 12 years.

The inclusion criteria of the selected sample were described in Table 6.1 and the details of the estimated participants number are presented in Table 6.2. Same inclusion criteria and participants have chosen for following two study (Studies Four and Five)

Table 6.1: Inclusion criteria of the selected group

Group	Inclusion criteria	Country included in this group
Australian-born immigrant children of NESB Immigrants	Second-generation children, children born in the host country (Australia)	China (excludes SARs and Taiwan), India, Sri Lanka, Viet Nam, and Malaysia, etc.
	Both parents born overseas from non-English-speaking background (NESB)	
	Either parent has an education background of an advanced diploma or higher(skilled)	

Table 6.2: The number of participants of the children of NESB skilled immigrants

Group	n	Male (%)	Age (Years) Mean	SD	Parents' country of origin
Children of non-English-speaking background (NESB) skilled immigrants	218	53.7	12.38	0.49	China (excludes SARs and Taiwan), India, Sri Lanka, Viet Nam, and Malaysia, etc.

6.4.3 Measurements of outcome variables

Emotional and behavioural problems

This study utilised the 'The strength and difficulties questionnaire (SDQ) (Goodman, 1997)' score from LSAC data to measure the children's emotional and behavioural problems. This is a behavioural screening questionnaire that is used to measure the emotional and behavioural problems of 3-16 years old children. SDQ is a widely used valuable instrument to measure the emotional and behavioural problems of children as well as children of immigrants (Runge, & Soellner, 2019; Achenbach et al., 2008). The questionnaire consists of 25 items rated on a three-point Likert scale from not true (0), somewhat true (1), and certainly true (2). In the questionnaire, some of the items (strength-related) were negatively worded, these items had their Likert scale results reversed (i.e., a score of 2 became 0) before the analysis.

Some of the items in the questionnaire were described as "I try to be nice to other people, I care about their feelings", "I am restless; I cannot stay still for long", "I get a lot of headaches, stomach-aches or sickness", "I get very angry and lose my temper", "I would rather be alone than with people of my age". The wording of items is provided in *Appendix V.* These 25 items were divided into 5 sub-scale; emotional symptoms, conduct problems, hyperactivity, peer relationship problems, and pro-social behaviour. This study used total mental health scores for children at their adolescent stage (12 years). The total difficulties score was calculated by adding all sub-scales scores except pro-social behaviour. Higher scores on SDQ reflect more emotional and behavioural problems. The scores were ensured: - up to 0-15 is within a normal range, 16-19 fall in borderline and 20-40 represents a clinical cut point. Internal reliability and validity were acceptable for the total difficulties scale and all subscales (Hawes & Dadds, 2004). The Cronbach's alpha level for the SDQ total Difficulties scale was above or near 0.8 and similar for each group though children were remarkably diverse linguistically and culturally. Cronbach alpha did not show any marked differences among the three selected groups for this research which are presented in Table 2.5.

151

6.4.4 Measurement of predictors associated with Emotional and behavioural problems

Six variables were included in analyses that aimed to identify predictors of individual differences in the severity of emotional and behavioural problems experienced by 12-year-old children of skilled immigrants from non-English-speaking backgrounds.

Extra-familial heritage cultural context:
Discrimination experienced by target children relative to that experienced by peers from their heritage group

This variable assessed whether target children experienced more discrimination that was normative for members of culture group. The score was calculated as the difference between the target child's score for self-reported experience of discrimination and the mean score for self-reported experience of discrimination across other children in their heritage culture group. Discrimination was measured using a 5-item checklist that was custom-designed for the LSAC. The items were: 1. In the last 6 months have you been treated unfairly or badly because of your language or accent? 2. In the last 6 months have you been treated unfairly or badly because of your skin colour? 3. In the last 6 months have you been treated unfairly or badly because of your disability? 4. In the last 6 months have you been treated unfairly or badly because of your religious beliefs? 5. In the last 6 months have you been treated unfairly or badly because of your cultural background? Children were asked to provide a . Yes/No answer to each item. The score for the checklist is the sum of "Yes" responses. Data concerning the psychometric properties of the checklist (i.e., validity, test-retest reliability, cross-cultural validity) are not available for this measure.

Home context:

 Primary caregiver's psychological distress

The primary caregiver's mental health was assessed by the six-item short form of the *Kessler Psychological Distress Scale (K-6)* (Kessler et al., 2002). The K6 contains 6 questions related to depression and anxiety. Participants are asked to rate the frequency with which they felt sad, nervous, restless, fidgety, hopeless, and that everything is an effort or worthless, during the last 30 days. The wording of items is provided in *Appendix VI.* Each item is rated on a 5-point scale: "All of the time"(1) "Most of the time"(2), "Some of the

time" (3), "A little of the time" (4), and "None of the time" (5). Low total scores reflect greater psychological distress. Total scores range from 6, which indicates a likely mental health disorder, to 30, which indicates the absence of psychological distress. This measure was used widely in Australia and in cross-cultural contexts. In the current thesis, the scale showed good internal consistency (α = 0.83) when used among immigrant caregivers from non-English-speaking countries.

Host cultural context:
Peer victimization experienced by target children relative to that experienced by peers from the host population

This variable assessed whether target children experienced more peer victimization (Bullying") that was normative for members of host culture group. The score was calculated as the difference between the target child's score for self-reported experience of peer victimization and the mean score for self-reported experience of peer victimization across children in the host culture group. Peer victimisation was measured using a 7-item checklist that was custom-designed for the LSAC. The items are: "Kids hit or kicked me on purpose," "Kids grabbed or shoved me on purpose," "Kids threatened to hurt me or take my things," "Kids saying mean things to me or called me names," "Kids tried to keep others from being my friend," "Kids did not let me join in what they were doing," and "Kids send me a mean text message/email or posted mean things about me on the Internet (e.g. on Facebook, Myspace)". Further details about this scale are provided in *Appendix VIII*. Children rated the frequency of each event on a 4-point scale: "Never" (1), "Once or twice" (2), "About once a week" (3), "Several times a week' (4).

Quality of child-teacher relationship

The children's perception of their relationship with their main teacher was measured using an 8-item scale that was custom-designed for LSAC. Sample items include, "I like my teachers," "My teachers respect my feelings" and "My teachers are proud of things I do." All 8 items are attached in *Appendix VII*. All items were positively worded. The frequency of perception was rated on a 4-point scale ("Almost never or never" (1), "Sometimes true" (2), "Often true" (3), "Almost always or always true" (4)). Child characteristics

Child characteristics:
Self-esteem

The child's self-esteem was measured by a 5-item scale that was custom-designed for the LSAC. Items were: "Overall, I have a lot to be proud of," "Most things I do, I do well," "Overall, most things I do turn out well," "I can do things as well as most people," and "If I really try, I can do almost anything I want to". Each item is rated on 5-point scale: "False" (1), "Mostly false" (2), "Sometimes false, sometimes true" (3), "Mostly true" (4), "True" (5). Higher scores reflect higher self-esteem.

Reactivity

Reactivity, also known as an irritable temperament, was assessed using a 4-item scale derived from the *Australian Temperament Study*. The items are: "Reacts strongly to disappointment," "Yells at others when angry," "Moody when corrected," and "Responds intensely to disapproval". The frequency of behaviours was rated on a 5-point scale: "Never" (1), "Rarely" (2), "Half the time" (3), "Frequently" (4) and "Always" (5) . The scale score is the simple sum of item scores, with higher scores reflecting greater reactivity. This scale demonstrated satisfactory internal consistency among its items (alpha=0.984) in this thesis.

6.5   Analysis plan

Data management and statistical analyses were performed using SPSS version 25 (IBM Corp, 2017). A complete case analysis was performed due to the limited number of missing values. Data normalities were visually checked using frequency histograms and normal Q-Q plots. Additionally, the Kolmogorov-Smirnov Test was applied for normality assessment. When continuous variables did not display a normal distribution, this study opted to either transform the variables or employ non-parametric statistical methods. Furthermore, the study identified any outliers and conducted analyses to assess their influence on data skewness.

Means and standard deviations (SD) were calculated for discrete and continuous data, while categorical variables were presented as percentages. In cases of insufficient cell numbers, the cells/categories will be collapsed or there will be a notation that the group results in each of the cells are based on small numbers and therefore should be treated with

caution. For non-normally distributed data, median and interquartile ranges (IQR) were reported. Scatterplots were drawn to examine the visual relationship between independent and dependent variables. Pearson product-moment correlation analysis was performed in SPSS, V25 to examine and explain the relationship between predictors and adaptation levels.

Hierarchical regression models were executed to explain the net effects of predictors through the guidance of Motti-Stefanidi et al. (2012) "the children of immigrant adaptation framework". Univariate models were first performed to explore the association between each predictor and the outcome. Multivariate modelling was then undertaken by adding predictors considered clinically important and statistically significant from the univariate models, to adjust for confounding between variables. The estimates were calculated using Ordinary Least Square method and were expressed as beta coefficients (β) from the hierarchical regression model. The linearity assumption between numerical predictors and the outcomes were checked and adjusted R-squared was used to evaluate the model goodness of fit, indicating the proportion of variance in child's emotional and behavioural problems explained by independent predictors.

To undertake the multivariate analysis, we developed a model that best predicts the values of the dependent variable using one or more predictors. A general linear model allows the inclusion of continuous and categorical predictor variables. In undertaking statistical analyses, due to the large numbers of respondents involved we were likely to use a conservative $P<0.05$ to assist with interpretation of whether the results were of a magnitude sufficiently large to be meaningful.

6.6   Result

6.6.1   Overview of the selected predictors, correlation, and univariate regression

This chapter first focused on individual predictor characteristics, the correlation between predictors and outcome, and the influence of predictors on the specific outcome. The findings of those predictors were carefully overviewed and significant findings are discussed for explaining emotional and behavioural problems (Table 6.3).

Predictors related to child's emotional and behavioural problems:
Extra-familial heritage cultural context:
Discrimination experienced by target children relative to that experienced by peers from their heritage group

Almost 98% (n = 213) of heritage peers of children provided responses about their distress from discrimination, with only 5 cases having missing data. The results showed that 86 (45%) heritage children suffered equal (no discrimination) or less discrimination, and 117 (55%) children experiencing more discrimination relative to their target child of NESB immigrants. Approximately half of the children experienced some degree of discrimination. The Pearson's correlation was executed to see the relationship between heritage peers who suffered discrimination relative to the target child and children's emotional and behavioural problems. The Pearson's found a positive significant correlation between discrimination suffered by the heritage peer group relative to the target child and the children's emotional and behavioural problems (r= 0.17; p < 0.018). Simple linear regression analysis supported the relationship between discrimination suffered by heritage peer-group relative to the target child and the NESB child's emotional and behavioural problems (β = 0.34; p = 0.049).

Home context:
Primary caregiver's psychological distress

Of the 218 participants, 206 (95%) parents provided responses regarding their psychological distress. The majority of parents did not exhibit any signs of psychological distress, resulting only 9 (4.4%) parents reporting psychological problems. However, it is important to note that most of them have a minimum level of psychological distress. The favourable mental health of primary caregivers of children of NESB immigrants contributed to the deviation from a normal distribution of psychological distress. By examining the Pearson's correlation, this study found no significant correlation (r = 0.11, p = 0.117) between primary caregiver's psychological distress and their emotional and behavioural problems. While it did not reach statistical significance, this variable holds theoretical significance for this study.

Host cultural context:
Peer victimization experienced by target children relative to that experienced by peers from the host population

Out of the total, 213 (97.7%) children provided responses regarding victimisation by bullying within their host peer group in relation to the target child, with only 5 cases lacking responses. The findings showed that only 61 (28.7%) host peers expressed equal or less bullying victimisation than their target child and 152 (71.3%) stated more bullying victimisation than their target child of NESB immigrants. The Pearson's correlation was utilised to see the relationship between host peers who suffered bullying victimisation relative to the target child and children's emotional and behavioural problems. The finding revealed that there was a significant positive correlation between host peer suffered bullying victimisation and children's emotional and behavioural problems ($r = 0.48$; $p<0.001$). It becomes evident that when host peers experienced more bullying victimisation in comparison to the target child, there was an observed increase in the emotional and behavioural problems exhibited by the children. Simple linear regression analysis supported the relationship between host peer suffered bullying victimisation and the NESB child's emotional and behavioural problems ($\beta = 0.83$; $p < 0.001$).

Quality of the child-teacher relationship

Almost all children (208, 95.4%) provided responses regarding the quality of the child-teacher relationship, with only 10 cases having missing data. Among these children, only 45 (21.8%) rated their child-teacher relationship as 20 or below, while 163 (78.2%) assigned a score of 21 or higher. The majority of children from NESB skilled immigrants reported having a high-quality relationship with their teachers.

The distribution of child-teacher relationship among NESB immigrants exhibited a non-normal distribution due to their high-quality relationship with their teachers. The Pearson's correlation was used to see the relationship between child-teacher relationship and children's emotional and behavioural problems. The correlation analysis ($r = -0.39$ ($p < 0.001$) showed that there was a significant negative correlation between the quality of relationships with the teacher and children's emotional and behavioural problems. The simple linear regression coefficient ($\beta = -0.32$, $p < 0.001$) supported the strong correlation. It

indicated that for each unit increase in the quality of the teacher-child relationship, there was an average decrease of 0.32 points in children's emotional and behavioural problems.

Child characteristics:

Self-esteem

Out of the entire sample, 213 children (97.7%) responded to the question about their self-esteem, with only 5 missing responses. The findings revealed that 159 (74.6%) children reported their self-esteem score of 20 or above, conversely, only 54 (25.4%) children expressed their self-esteem scores of 19 or less among children of NESB skilled immigrants.

The slight left-skewness in the data can be attributed to the fact that most children from NESB skilled immigrants reported having a high level of self-esteem. The Pearson's correlation was used to see the relationship between their self-esteem level and their emotional and behavioural problems. There was a statistically significant negative correlation ($r = -0.46$, $p < 0.001$) observed between the degree of self-esteem and the emotional and behavioural problems in children. As their self-esteem level increased, there was a corresponding decrease in their emotional and behavioural problems. The univariate regression analysis supported this finding and showed that the child's emotional and behavioural problem was decreased by 0.70 units ($\beta = -0.70$, $p < 0.001$) for each unit increment of their level of self-esteem.

Reactivity

In total, 211 (96.8%) children responded their level of reactivity with only 7 (3.2%) children didn't provide their response. The results indicated that among children of NESB immigrants, 116 children (54.9%) had a negative reactivity level of less than 2, indicating that they rarely or never reacted negatively with others. Additionally, 75 children (35.5%) had a negative reactivity level of 3 or less, signifying that they reacted negatively with others approximately half of the time. Only 20 children (9.4%) had a negative reactivity level of 5 or less, indicating that they frequently or always reacted negatively with others. It showed a mixed reaction among children reactivity which is relatively normal in general.

Children of NESB immigrants expressed mixed reactions in their responses and in this context. The Pearson's correlation was used to see the relationship between their reactivity level and their emotional and behavioural problems. Pearson's correlations found a significant positive correlation between the level of reactivity and children's emotional and behavioural problems ($r = 0.36$, $p<.001$). Both variables exhibited a positive correlation, suggesting that as the level of negative reactions increased, children's emotional and behavioural problems also increased. Specifically, for each unit increase in children's level of negative reaction, their emotional and behavioural problems increased by an average of 2.24 points ($\beta = 2.24$, $p < 0.001$).

Table 6.3: Correlation and univariate regression models for child's emotional and behavioural problems by selective predictors

Predictors	Pearson Product Moment		Univariate linear regression models		
	Coefficient (r)	P value	Coefficient (β)	(95% CI)	P value
Discrimination experienced by the target child relative to that experienced by peers in the heritage culture group	0.17	0.018	0.34	(-.002, .67)	0.049
Primary caregiver's psychological distress	0.11	0.117	2.8	(-.38, 5.98)	0.084
Victimisation experienced by the target child relative to that experienced by peers in the host culture group	0.48	< 0.001	0.83	(.63, 1.04)	<0.001
Quality of the child-teacher relationship	- 0.39	< 0.001	- 0.32	(- .43, -.22)	<0.001
Self-esteem	- 0.46	<0.001	- 0.70	(- .90, -.50)	<0.001
Reactivity	0.36	< 0.001	2.29	(1.49, 3.09)	<0.001

6.6.2   Hierarchical regression models

Overall findings of predictors of emotional and behavioural problems

Hierarchical regression was used to find the relationship between the predictors and the emotional and behavioural problems of children of NESB skilled immigrants (figure 6.2). Hierarchical regression was labelled as Model 1 and Model 2. All the predictors related to the child's home context (Primary caregiver's psychological distress) and the child's characteristics (self-esteem, and reactivity) were included only in Model 1. In Model 2, the child's heritage context (Discrimination experienced by the target child relative to that experienced by peers in the heritage culture group) and host culture context (Victimisation experienced by the target child relative to that experienced by peers in the host culture group; and Quality of the child-teacher relationship) were included along with the child's home context and child's own characteristics. This modelling strategy was conducted to assess the suitability of applying the framework of "Immigrant Youth Adaptation in Context" by Motti-Stefanidi et al. (2012) to children NESB skilled immigrants in Australia.

Model 1 demonstrated that the combined influence of home context and child characteristic predictors significantly associated with children's emotional and behavioural problems, resulting in an overall adjusted R-squared value of 0.26 at $p < 0.001$. In otherwards, Model 1 accounted for 26% of the variability in children's emotional and behavioural problems using information related to the child home context and child's characteristics. In Model 2, it was evident that the combined influence of factors related to home context, child characteristics, heritage and host culture context, along with peer group predictors, significantly related to children's emotional and behavioural problems. The outcomes indicated that the total adjusted R-squared was 0.40, a statistically significant finding at $p < 0.001$. Model 2 accounted for 40% of the variance in children's emotional and behavioural problems, considering the variables included in the model. The adjusted R-squared was increased by 14% by including heritage and host culture context along with peer group predictors. This revealed the applicability of Motti-Stefanidi et al. (2012) framework "Immigrant Youth Adaptation in Context" to examine and explain the emotional and behavioural problems among second-generation children of NESB skilled immigrants. The result showed that- four out of six predictors were independently significant with the child's emotional and behavioural problems. The regression coefficient of the child's Self-

Esteem showed that the child's emotional and behavioural problems were significantly decreased by 0.62 (β = -0.62, p < 0.001) for each unit increment of the child's level of self-esteem (Model 1). This predictor significantly explained the child's emotional and behavioural problems in Model 2. For each unit increase in the child's self-esteem, the child's emotional and behavioural problems were decreased by 0.40 (β = -0.40, p < 0.01). The Child's reactivity was significant in both Model 1 and Model 2. The positive coefficient showed that the child's emotional and behavioural problems were increased by 1.60 units (β = 1.60, p < 0.001), for each unit increment of the child's irritable temperament. In Model 2 this predictor explained the child's emotional and behavioural problems (β = 1.29, p < 0.001). Additional variables such as discrimination experienced by the target child relative to that experienced by peers in the heritage culture group; victimisation experienced by the target child relative to that experienced by peers in the host culture group and quality of the child-teacher relationship were included in Mode 2 to determine if they contributed to the understanding of emotional and behavioural problems in this distinct group. The predictors related to victimisation experienced by the target child relative to that experienced by peers in the host culture group host, and the quality of the child-teacher relationship were found to be statistically significant and displayed a positive association with emotional and behavioural problems. Specifically, for each unit increase in the host peer group's victimisation by bullying relative to the target child, the child's emotional and behavioural problems increased significantly by 0.67 units (β = 0.67, p < 0.001). Conversely, for each unit increase in the quality of the child-teacher relationship, the child's emotional and behavioural problems decreased by 0.11 units (β = -0.11, p = 0.049).

Figure 6-2: Predictors of emotional and behavioural problems

***p < .001; **p < .01; *p < .05

Victimisation experienced by the target child relative to that experienced by peers in the host culture group

Factors in host culture context

Quality of the child-teacher relationship

M2 = -0.67***

M2 = -0.11*

Factors in home context

Primary caregiver's psychological distress

M1 = 0.04
M2 = 0.06

Factors in the heritage culture context

Discrimination experienced by the target child relative to that experienced by peers in the heritage culture group

M2 = - 0.19

Child characteristics

Self-esteem

Reactivity

M1 = -0.62***
M2 =-0.40***

M1 = 1.60***
M2 = 1.29***

child's emotional and behavioural problems

Model 1 = 0.26***

Model 2 = 0.40***

R Square change = 0.14***

6.7   Discussion

This study aimed to identify the predictors as well as the applicability of Motti-Stefanidi's framework to explain emotional and behavioural problems among children of NESB immigrants. Predictors were selected from the previous research and the guidance of Motti-Stefanidi's framework "The Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012). Hierarchical regression models were applied to explore the contribution of the selected predictors. In the context of assessing the applicability of the selected framework for understanding emotional and behavioural problems within a unique group, characterised by second-generation, non-English speaking and skilled immigrants backgrounds. This study focused on six specific predictors. The findings demonstrated the significant variances when heritage and host peer and cultural context related predictors included with parents and child characteristics predictors to run the hierarchical multiple regression model. Therefore, the findings explained effectively Motti-Stefanidi's framework's applicability of the emotional and behavioural problems observed in children of NESB skilled immigrants (Motti-Stefanidi et al., 2012).

The results indicated that four out of the six individual predictors reached a statistically significant level. These significant predictors included the child's self-esteem, the child's reactivity, victimisation experienced by the target child relative to that experienced by peers in the host culture group, and the quality of the child-teacher relationship. The results showed a higher level of self-esteem associated with a lower level of emotional and behavioural problems in children of NESB immigrants. Earlier studies have identified a positive association between children's self-esteem and emotional and behavioural problems. (Motti-Stefanidi et al., 2012; Nakash et al., 2012). According to Nakash et al. (2012), lower levels of self-esteem of immigrant children are linked to an enhancement in their psychosocial well-being. The results revealed a higher level of a child's negative temperament increased the emotional and behavioural problems of children of NESB immigrants. Furthermore, the predictors related to peers among immigrant children had an impact on the emotional and behavioural problems of children of NESB immigrants. When host peers experienced a higher level of bullying victimisation relative to the target child, it led to an increase in their emotional and behavioural problems. Children's quality of relationship with their teacher from the host context also influenced their emotional and

behavioural problems. Specifically, as the quality of the child-teacher relationship improved, there was a noticeable decrease in their emotional and behavioural problems. The findings displayed significant variances, when the predictors related heritage and host culture context included with parents and child related predictors. Therefore, their emotional and behavioural problems decreased significantly which demonstrate the applicability of Motti-Stefanidi's framework in explaining the emotional and behavioural problems observed in children of NESB skilled immigrants.

6.8   Strength and Limitations

Little current research had driven by the theory. The "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) framework was used to expand the selected theory applicability on the adaptation of second-generation children of skilled immigrants backgrounds, that represent a strong strength of this study. The dataset had several limitations, such as some important predictors being unable to select because no variance had been found within the group. Some measurements exhibited floor and ceiling effects, while others were insensitive to cultural differences. Additionally, the sample size was relatively small, and this was particularly evident in the case of the "Parents' status as skilled or unskilled immigrants" predictors, which had to be excluded due to the insufficient number of samples in each group. It's important to note that these limitations could impact the explanatory power of the predictors, as altering any one of them might yield different results.

6.9   Conclusion

In conclusion, four out of six predictors associated with, and the "Immigrant Youth Adaptation in Context" framework proposed by Motti-Stefanidi et al. (2012) effectively explained the emotional and behavioural problems of children of NESB skilled immigrants. The analysis specifically focused on second-generation immigrant children who born in the host country, who were of NESB skilled immigrant backgrounds. Despite the above limitations, this discovery stands out as noteworthy in comparison to prior research. It can serve as a valuable reference for future research and has implications for policymakers and practitioners. This study focused into the unique context of second-generation immigrant children from non-English language and skilled immigrant backgrounds and employed a

well-established framework to explore, structure, and clarify its applicability in understanding the adaptation of this distinctive group, marking a significant contribution to the field.

CHAPTER 7 — STUDY FOUR: PREDICTORS ASSOCIATED ACADEMIC ACHIEVEMENT IN READING PERFORMANCE

7.1 Overview

Successful adaptation on academic achievement is one of the key markers of how well immigrant children adapt to a host country's vital academic system. Reading performance represent one of the prominent academically successful area. This is elaborately based on the host language, that displays children's proficiency with the host language. In the first study, though children of NESB immigrants showed an above-average mean in reading performance in comparison to children of native-born parents and children of ESB immigrants, there was a considerable variability in reading outcomes within the children of skilled immigrants from NESB. A certain percentage of children of NESB immigrants showed a lower level of academic achievement in reading performance compared to children of native-born parents and children of ESB immigrants. For example, in Study One findings showed 16.6% of children of NESB immigrants children belong to the lower fourth quartile in reading scores compared to the children of native-born parents, and 21.5% compared to the children of ESB immigrants. Exploring predictors associated reading performance of children of skilled immigrants from NESB would guide their future positive adaptation in their reading performance. However, a gap was observed in previous research to explain these individual variances on reading performances of children of skilled immigrants. Moreover, most of the findings was not theory driven. This study would use to identified influenced predictors by the guidance of previous research and a well-known framework "The Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012). Currently, this framework was tested only for mixed samples of first- and second-generation immigrants. In locations (Greece) in which most immigrants come from two immigrant backgrounds such as "Albania" and "Pontian Greek" and a considerable number was unskilled immigrant backgrounds. The extent to which the framework was applied to second-generation children of skilled immigrants and to which the framework was applicable in countries with a selective immigration policy is therefore unclear. To acknowledge this gap, this study sought to identify the predictors and applicability of a well-known framework "The Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al.,

2012), that predict individual differences or variability in reading performance of second-generation children of skilled immigrants. This study was conducted when children was their transition age from primary school to secondary school at aged 12 years. This is a significant age to look at their findings because children experienced lots of developmental process in this age (e.g., physical change for puberty, identity development, manage with stress level to start senior schooling).

7.2 Selecting predictors associated children academic achievement in reading performance

This study selected predictors explored individual variances of emotional and behavioural problems of children by the guided of previous research and at the interaction and child levels of Motti-Stefanidi et al.'s (2012) "Immigrant Youth Adaptation in Context" framework. The framework suggests that the influence of factors at the societal level have their influence on adaptation via their influence on factors at the interaction and individual child levels. Selected influenced predictors to explain individual differences on both reading performance (Study Four, Chapter 7) and numeracy performance (Study Five, Chapter 8) have discussed below and displayed in Figure 7.1.

Both familial and extra-familial contexts represent as interaction level of the selected framework. Family resources or family relayed predictors play a prominent role in children's academic achievement in both areas: reading and numeracy performances. Immigrant children are not different in this context. The previous research demonstrated children of immigrant parents who have better host language proficiency outperform native-born children (Casey & Dustmann, 2008; OECD, 2006; Schnepf, 2007; Washbrook et al., 2012). Family resources promote the academic achievement of children of immigrants (Motti-Stefanidi et al., 2012; Motti-Stefanidi, 2014; Anagnostaki et al., 2016). Family contextual factors were associated with academic achievement in reading performance (Chen et al., 2015). Immigrants' parents' education level and their education expectations for their children have possibility to contribute on children's academic achievement. Research found that immigrants parents had high education aspirations related to their children's academic achievement (Koustourakis et al., 2016; LSAC, 2014). The previous research has displayed that parent elevated levels of education expectations were positively associated with their

children's educational expectations (LSAC, 2014). Study Four and Five both studies would focus on primary caregivers education level, and mother's interest in education.

Contexts outside the home have been shown to influence the children academic achievement in reading and numeracy performance. Level et al. (2008) argues that in immigrant-receiving countries with well-established immigration laws, strict regulations can account for the improved educational performance of immigrant children. Due to the effects of selective migration policies, this observation could potentially be extended to skilled immigrants in comparison to unskilled immigrants. Motti-Stefanidi's frameworks indicate that children's heritage and host peer-group education expectations, as well as their meaningful relationships with peers (Asendorpf & Motti-Stefanidi, 2017) and teachers, have a positive association with their academic achievements (Özdemir & Stattin, 2014; Motti-Stefanidi et al., 2012). Ly et al. (2012) discovered a positive association between the quality of the child-teacher relationship and the academic success of children from immigrant backgrounds. Regarding the extra-familial predictors at the interaction level of the framework, Study Four and Study Five focused on positive teacher-child relations, and heritage peer education expectation relative to the target child to measure individual differences on academic achievement in reading and numeracy performance of children of skilled immigrants from NESB.

Child characteristics are highly interrelated with the reading and numeracy performances of children of immigrants. Previous research has established that the individual assets of immigrant children are linked to their adaptation to academic achievement (Motti-Stefanidi et al., 2012; Motti-Stefanidi, 2014 Anagnostaki et al., 2016; Motti-Stefanidi, 2015). These assets include their educational expectations and non-verbal intelligence levels, as evidenced by LSAC study (LSAC, 2014). An increased educational expectation in children is associated with improved academic achievement among children of immigrants (Hao & Bonstead-Bruns, 1998; Rosenbaum & Rochford, 2008). The findings showed comparable outcomes in both reading and numeracy achievements (LSAC, 2014). Child persistence had an impact on children's math performance, with English language proficiency playing a moderating role in math learning, as demonstrated by Bumgarner et al. (2013). Similarly, Solberg et al. (2008) found that children's high self-efficacy and persistence was associated with academic achievement and children high school completion. A higher-

level self-esteem in children of immigrants was linked to their ability to overlook negative feedback concerning their academic abilities (Lew & Harklau, 2018). Additionally, lower levels of school engagement among immigrant children could potentially result in lower level of academic achievement than children of native-born parents (Motti-Stefanidi et al., 2015). Studies 4-5 will focus on individual-level predictors, including a child's self-esteem, level of school engagement, perseverance in academic tasks, and non-verbal intelligence.

Most of the research findings related to the academic achievements of children of immigrants in reading and numeracy performance have been based on first-generation immigrant children or pooled samples of first- and second-generation immigrant children, primarily from unskilled immigrant backgrounds. Additionally, previous studies have not typically differentiated samples based on heritage or the home country language (English and non-English- speaking countries). The majority of this research has been conducted in the USA and Europe. Consequently, it remained unclear to what the framework was applied to second-generation children of skilled immigrants from non-English speaking countries and whether the framework was applicable in countries with a multi-cultural selective immigration program. To acknowledging this gap, Study Four and Study Five aimed to explore the applicability of this framework for a new group of second-generation children with distinct characteristics, including being from non-English-speaking backgrounds and having skilled immigrant parents in Australia. Figure 7.1 provides an overview of the variables that were included in the current application of the "Immigrant Youth Adaptation in Context" framework in the context of academic achievement in reading (Study Four) and numeracy (Study Five) performances experienced by second-generation children of NESB skilled immigrants.

The predictors associated with reading performance also exhibit a connection with numeracy performance. To address this, the predictors from previous research related to both reading and numeracy performance were considered. However, this chapter specifically outlines its objectives, hypotheses, and the relationship of predictors with reading performance.

Figure 7-1: Research model showing interaction and individual-level predictors of individual differences in reading and numeracy skills among children of immigrants from non-English-speaking background (inspired by Motti-Stefanidi et al., 2012)
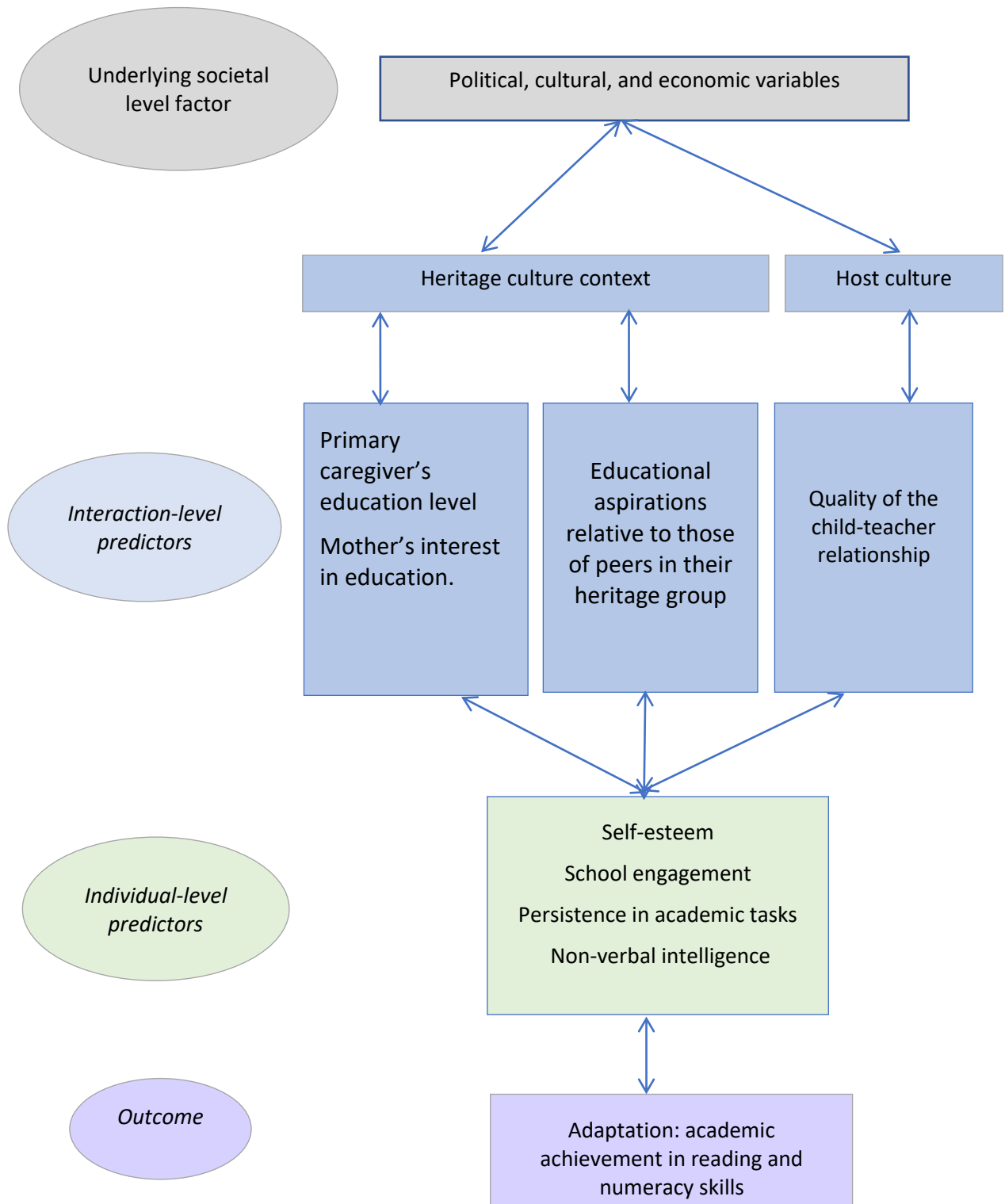
7.3 Research aims

Aim-I: To identify the predictors that account for individual differences on academic achievement in reading performance within second-generation children of skilled immigrants from NESB at 12 years of age.

Aim-II: To test the applicability of the theoretical framework the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) to the second-generation children of skilled immigrants from NESB in Australia.

 Hypothesis

1. At the age of 12 years, the NAPLAN reading, and numeracy scores would be negatively correlated with
    - Self-esteem.
2. At the age of 12 years, The NAPLAN reading and numeracy performance of second-generation children of NESB skilled immigrants' would be positively correlated with
    - primary caregiver's education level
    - mother's interest in education
    - positive relationship with their main teacher
    - educational aspirations relative to those of peers in their heritage group
    - school engagement
    - persistence in academic tasks and
    - Non-verbal intelligence.
3. The research model depicted in Figure 7.1 would explain the significant amount of variance in academic achievement in NAPLAN reading and numeracy scores of second-generation children of skilled immigrants from NESB at aged 12 years.

7.4 Methodology

This study focused on identifying the factors that influence academic achievements in reading performance among children of NESB immigrants during their transition to high school at the age of 12 years. This specific age group during adolescence was chosen because it represents a developmental transition marked by numerous changes in children's

lives, which can potentially impact to their educational performance. These changes may include physical hormonal changes (puberty), the transition from primary school to secondary school, the development of self-identity, the establishment of friendship and peer networks. This study utilised the same archival database, the Longitudinal Study of Australian Children (LSAC). In addition to the LSAC dataset, this study also utilised the National Assessment Program-Literacy and Numeracy (NAPLAN) dataset to explain their academic achievement in reading performance. NAPLAN scores were integrated with the LSAC dataset according to the child's unique identification number.

7.4.1 Database, "The Longitudinal Study of Australian Children (LSAC)"

"Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC)" archival data set was the Australian first nationally representative longitudinal study. It main focused on child development. This study was inaugurated with two cohorts in 2004: the Baby Cohort included children when they were 0 to 1year old and the Kindergarten Cohort included children when they were 4 to 5 years old. Both cohorts included 5,000 children at the recruitment wave. Every two years since 2004; children and their families have been visited and data were collected on child, parent, family, community, and their school characteristics that influence various areas of development of children according to ages.

The sample was selected randomly from Australian states and territories except the most remote areas to increase the representativeness of Australia nationwide. Data were collected in many ways; face-to-face interviews, direct assessments of the children, computer-assisted self-interview, and paper questionnaires. The Department of Social Services (DSS), the Australian Institute of Family Studies (AIFS), and the Australian Bureau of Statistics (ABS) have conducted this study in their partnership.

This study used the data from both the Baby Cohort and Kindergarten Cohort and data were extracted from wave 7 in the Baby Cohort and wave 5 in the Kindergarten Cohort at the age of 12 years. Details can be found in Chapter 2.

7.4.2 Participants

Similar to Study Three, the same group of children from NESB immigrants were selected as participants from the LSAC dataset for this Study Four. The study adhered to the same inclusion criteria (Table 6.1) and involved the same number of participants (Table 6.2).

As Study Three, same children of NESB immigrants selected as a participant from the LSAC dataset for this Study Four. Same inclusion criteria (Table 6.1) and the participants number (Table 6.2) were included for this study too.

7.4.3 Measurements of outcome variables

Academic achievement in reading

In Study 4 and 5, the NAPLAN scores were used to explain the academic skills of children in reading performance. NAPLAN is the national academic assessment program for reading, writing, language conventions (spelling, grammar, and punctuation), and numeracy. Most Australian students in years 3, 5, 7, and 9 attend this assessment in every year since 2008. This created a possibility to get a nationally representative sample of second-generation children. Every year the Australian Curriculum Assessment and Reporting Authority (ACARA) administered NAPLAN.

NAPLAN is an annual assessment program that administered in Australia to students in Years 3, 5, 7, and 9. The tests are usually conducted in classrooms during school hours over a specific period, typically spanning three days. It is designed to assess students' literacy and numeracy skills and provide a snapshot of their progress in these areas. This study focused on Year 7 reading skills of children of skilled immigrant from NESB in their school year. Students read a variety of texts and answer questions that access their comprehension, interpretation, and critical thinking skills in their reading assessment. NAPLAN tests use a mix of response formats to assess students' skills: Multiple-choice and short-answer questions where students provide written responses to prompts. Correct answers are assigned scores, contributing to the overall score. No partial credit is usually given. NAPLAN accesses the performance of children from 0-1000 in reading. 0 represents the lowest score and 1000 is the highest score. These raw scores are then standardized to form scale scores. To aid the interpretation of scale scores, these are classified into bands,

with higher scale scores being assigned to higher bands. Band 4 represents the minimum level of reading skills necessary in Year 7, for a successful transition to Year 8 (NAPLAN, 2019). Following Table 7.1 shows the scale score range for each band for numeracy assessments in Years 7. Blue font was used to differentiate the national average scores and Band in reading performance according to Year 7 level.

Table 7.1: NAPLAN reading scale score equivalence to the band in year 7 (2012)

Scale score	Band
139.5 - 422.9	4
431.7 - 472.0	**5**
479.6 - 523.5	6
530.7 - 576.2	7
584.4 - 630.6	8
641.7 – 865.8	9

7.4.4 Measurement of predictors associated with academic achievements in reading performance

Eight identical factors were included in analyses that aimed to identify predictors of individual differences in the level of academic achievement in both reading and numeracy performance by 12-year-old children of skilled immigrants from non-English-speaking backgrounds. (same predictors selected for following Study 5, Chapter 8).

Extra-familial heritage cultural context:
Target children's educational aspirations relative to those of peers in the heritage culture group

This variable assessed whether target children had higher educational aspirations that was normative for members of their heritage culture group. The score was calculated as the difference between the target child's score educational aspirations and the mean score for educational aspirations across children in the heritage culture group. Children's educational aspirations were measured using a single custom-designed item: "Looking

ahead how far you think you will go with your Education?" Children selected one of 5 options: "Leave school before finishing secondary school or completing any further qualification" (1), " Complete secondary school" (2), "Complete a trade or vocational training course" (3), "Complete an undergraduate university degree" (4), "Complete a postgraduate qualification or degree"(5).

Home context:
Primary caregiver's education level

The primary caregiver's education level was measured using a single self-report item: "Postgraduate degree" (6), "Graduate diploma/certificate" (5), Bachelor's degree (4), Advanced diploma/diploma (3), Certificate (2), "Other" (1).

Mother's interest in education

Mothers' interest in education was measured by a single custom-designed item completed by children. There were 5 response alternatives: " A lot of interest" (5); " Some interest" (4), " Not much interest" (3), " No interest at all" (2), "Do not have a mother" (1)

Host cultural context:
Quality of the child-teacher relationship

Children's perception of their relationship with their main teacher was measured using an 8-item scale that was custom-designed for LSAC. Sample items include, "I like my teachers," "My teachers respect my feelings" and "My teachers are proud of things I do." All 8 items are listed in *Appendix VII*. All items were positively worded. The frequency of perceptions was rated on a 4-point scale: " Almost never or never" (1), "Sometimes true" (2), "Often true" (3), "Almost always or always true" (4).

Child characteristics:
Self-esteem

The child's self-esteem was measured by a 5-item scale that was custom-designed for the LSAC. Items were: "Overall, I have a lot to be proud of," "Most things I do, I do well," "Overall, most things I do turn out well," "I can do things as well as most people" and "If I really try, I can do almost anything I want to". Each item is rated on 5-point scale: "False" (1), "Mostly false" (2), "Sometimes false, sometimes true" (3), "Mostly true" (4), "True" (5). Higher scores reflect higher self-esteem.

School engagement

 An 8-point custom-designed scale was used to measure children's school engagement. This was rated by child's schoolteacher. Example items are "Works hard", "Relates well to other students", and "Absent". All items are listed in *Appendix IX*. The frequency of behaviours was rated on a 5- point scale: "Never" (1), " Rarely" (2), "Some of the time" (3), "Most of the time" (4), "All of the time" (5). In this thesis, this scale exhibited strong internal consistency among its items (alpha = 0.996).

Persistence in academic task

The child's persistence was measured using a 4-item custom-designed scale. The items were: "Homework incomplete unless reminded," "Remembers homework without reminders," "Goes back to task after interruption, and "Difficulty completing assignments". The frequency of behaviours was rated on a 5-point scale: "Never" (1), " Rarely" (2), "Half the time" (3), "Frequently" (4), "Always" (5).

Non-verbal intelligence

Non-verbal intelligence was measured using the Matrix Reasoning sub-test of the Wechsler Intelligence Scale (WISC-IV) (Wechsler, 2003). Children's score when they were 10 years of age was used because the test was not administered at 12 years of age. The test contains 35 items, each of which present the child with an incomplete picture. The child is required to complete the figure by choosing one of five options. A higher score represents a higher non-verbal intelligence level.

7.4.5   Analysis plan

Data management and statistical analyses were performed using SPSS version 25 (IBM Corp, 2017). A complete case analysis was performed for missing values due to a small proportion of missingness in the sample dataset.

Data normalities were visually checked using frequency histograms and normal Q-Q plots. In addition, Kolmogorov-Smirnov Test was used to assess the normality. If the continuous variables were not normally distributed, the transformation of the variables was performed, or the non-parametric statistical approaches were used. Any outliers were

identified, and analyses were undertaken to determine the impact the outliers have on skewing the data.

Means and standard deviations (SD) for discrete and continuous data were calculated and categorical variables were presented as percentages. If there were insufficient numbers in each cell, the cells/categories would be collapsed or there would be a notation that the group results in each of the cells were based on small numbers and therefore should be treated with caution. For non-normally distributed data, median and interquartile ranges (IQR) were reported.

Scatterplot was drawn to see the visual relationship between independent and dependent variables. Pearson product-moment and Spearman's rank correlation analysis were used to find out the relationship between predictors and academic achievement in reading for the numerical and ordinal nature of data. Hierarchical regression models were applied to explain the effects of predictors through the guidance of the Motti-Stefanidi et al. (2012), the framework "Immigrant Youth Adaptation in Context".

Initially, a univariate analysis was performed and then followed by a multivariate analysis. To undertake the multivariate analysis, this study built the model that best predicts the values of the dependent variable using one or more predictors. A general linear model allows the inclusion of continuous and categorical predictor variables. The linearity assumption between numerical predictors and the academic achievement in reading scores were checked. In order to assess the goodness of fit, an adjusted R-squared was calculated signifies the proportion of variance in numeracy performance scores that can accounted for by the independent predictors. In undertaking statistical analyses, it was likely to use a conservative $P < 0.05$ to assist with the interpretation of whether the results were of a magnitude sufficiently large to be meaningful.

7.5 Results

7.5.1 Overview of the selected predictors and univariate correlation

To see the association of each selected predictor on academic achievement in reading, this study first focused on frequency of each predictor, correlation, and their influence on the specific outcomes. Furthermore, Table 8.4 displayed correlation and

univariate regression for child's academic achievement in reading performance by eight selected predictors. The summary of findings for each predictor revealed unique insights. These findings for each predictor of academic achievement in reading performance were discussed below and report the main findings of this study.

Predictors related to child's academic achievement in reading skills:
Extra – familial heritage cultural context:
Target children's educational aspirations relative to those of peers in the heritage culture group

In total, 217 (97%) parents provided responses regarding the educational aspiration of their heritage peer group relative to the target child. Only 1 child (2%) had missing data in this regard. The table showed that 178 (82%) heritage peers had an equal or lower level of academic aspiration related to their target child, and only 39 (18%) had a higher level of academic aspiration relative to their target child of NESB skilled immigrant. Spearman's rank correlation analysis was performed due to the ordinal nature of educational aspiration data. The correlation analysis found a significant ($\rho = 0.29$, $p < 0.001$) relationship between these two variables. As the level of academic aspiration increased, there was a corresponding rise in their literacy scores in academic achievement. The results from a simple linear regression model indicated a significant relationship between the child's reading score and the heritage peer group's educational aspiration relative to the target child's educational achievement in reading. The beta coefficient of 59.12 ($\beta = 59.12$, $p < 0.001$) indicated that, on average, the reading score increased by 59.12 points when the heritage peer group had higher educational aspirations compared to lower aspirations.

Home context:
Primary caregiver's education level

Of 218 participants, 204 (93.6%) parents provided responses regarding their education level, with minimal missing values for 14 participants (6.4%). Among these respondents, 180 (88.2%) primary caregivers had completed an advanced diploma/diploma or higher level of education, while 24 (11.8%) primary caregivers had completed a certificate or other levels of education. Like the previous factor, a Spearman's rank correlation analysis was performed due to the ordinal nature of education level data and found a substantial positive ($\rho = 0.17$, $p = 0.023$) relationship between their primary caregivers' education level and academic achievement in numeracy. The linear regression model indicated a significant

179

relationship between the child's reading score and the education level of primary caregivers. Specifically, the reading score showed a significant increase of 39.2 units (β = 39.2, p = 0.019) when primary caregivers had a higher education level compared to those with a lower education level.

Mother's interest in education

Of 218 participants, 213 (97.7%) parents who responded to their education level with minimal missing values 5 (2.3%). Among them, 154 (72.3%) mothers showed a lot of interest in education and 59 (27.7%) mothers showed some interest to no interest at all. As the data type of mother's interest in education is ordinal in nature, Spearman's rank correlation analysis was conducted and found no significant relationship between their mother's interest in education and academic achievement in reading. Although this predictor did not show statistically significant, this variable is important for this study from a theoretical perspective.

Host cultural context:

Quality child-teacher relationship

Of 218 children analysed, 208 (95.4%) children provided responses regarding the quality of the child-teacher relationship, with 10 cases having missing data. Of these children, Only 45 (21.8%) children reported scores up to 20, while 163 (78.2%) scored their quality of child-teacher relationship as either 21 or more. The majority of children from NESB immigrants expressed a high-quality relationship with their teacher. Although Pearson correlation analysis did not reveal a significant correlation (r=0.002, p=0.982) between the quality of the child-teacher relationship and the academic achievement in reading skills of children of NESB immigrants, it was included in the analysis due to its theoretical significance in explaining children's academic achievement.

Child characteristics:
Self-esteem

Out of the total 218 children, 213 (97.7%) children provided responses regarding their level of self-esteem, with only 5 (2.3%) children having missing data. It was found that 159 (74.6%) children scored their self-esteem 20 or above, while only 54 (25.4%) children expressed their self-esteem level 19 or less among children of NESB immigrants. The

majority of these children of NESB immigrants expressed elevated levels of self-esteem. Pearson product-moment correlation was used to see the relationship between their self-esteem level and their academic achievement in reading. While the correlation did not yield statistically significant results (r=0.09, p=0.32), this predictor was retained for the final analysis due to its theoretical importance.

School engagement

In total, 164 (75.2%) parents provided their responses to their school engagement level with 54 (24.8%) children having missing data. It was discovered that 151 (92.2%) children scored their school engagement level above three and a half. Conversely, only 13 (7.8%) children expressed their school engagement level at or below three and a half, with none of the children scored below 2.30. This pattern was observed among children of NESB immigrants. The Pearson correlation coefficient showed that there was a significant positive relationship between their level of school engagement and their academic achievement in reading (r = 0.31, p < 0.001). The simple linear regression supported the significant relationship between these two variables. The coefficient (β = 44.12, p < 0.001) showed that the academic achievement in reading scores was increased by 44.12 for each unit increment of their level of positive school engagement.

Persistence in academic tasks

Of 218 participants, 210 (96.3%) children provided responses on their level of persistence with minimal missing values reported for 8 children (3.7%). The findings revealed that 167 (77.7%) children scored their persistency level above three and only 47 (22.4%) children expressed their academic persistence level three or less among children of NESB immigrants. This data indicated that the majority of NESB immigrant children displayed a higher level of persistence with their academic tasks. Pearson correlation analysis found a positive significant correlation ((r = 0.23, p = 0.01) between their level of persistence and academic achievement in reading. The relationship was found significant from the simple linear regression model (β = 18.08, p = 0.01). This suggests that for each unit increase in their level of persistence, there was an associated increase of 18.08 points in the educational achievement scores for reading. model (β = 18.08, p = 0.01).

Non-verbal intelligence

Of 218 participants, 200 (91.7%) parents provided responses to their level of non-verbal intelligence skill, with only 18 participants (8.3%) having some missing data. Non-verbal intelligence was measured using the sub-test of the Wechsler Intelligence Scale (WISC-IV) (Wechsler, 2003) for children at 10 years. Pearson correlation analysis revealed a statistically significant relationship ($r = 0.46$, $p < 0.001$) between the child's level of non-verbal intelligence and their academic achievement in reading. As the level of non-verbal intelligence increased, so did the scores for academic achievement in reading. The linear regression model further supported this relationship, indicating that for each unit increase in the child's non-verbal intelligence, there was an associated increase of 11.28 points in their reading scores ($\beta = 11.28$, $p < 0.01$).

Table 7.2: Correlation and univariate regression models for child's academic achievement in reading by selective predictors.

Predictors	Pearson Product Moment/ Spearman's rank-order correlation		Simple linear regression models		
	Coefficient (r/ρ)	P value	Coefficient (β)	(95% CI)	P value
Educational aspirations relative to those of peers in their heritage group (high aspirations)	0.29	<0.001	59.12	(34.05, 84.10)	< 0.001
Primary caregiver's education level (high education level)	0.17	0.023	39.22	(6.42, 72.04)	0.019
Mother's interest in education (high interest)	-0.08	0.27	-1.13	(-24.13, 21.87)	0.923
Quality of the child-teacher relationship	0.002	0.982	0.01	(- 1.95, 1.95)	0.99
Self-Esteem	0.09	0.334	1.96	(- 1.54, 5.45)	0.271
School engagement	0.31	<0.001	44.12	(22.50, 65.74)	<0.001
Persistence in academic tasks	0.23	.009	18.08	(4.9, 31.26)	0.007
Non-verbal Intelligence	0.46	<0.001	11.28	(8.41, 14.15)	<0.001

7.5.2 Hierarchical regression models

Overall findings of academic achievement in reading skills

Hierarchical regression models were used to assess and quantify the factors contributing to academic achievements in reading among children of NESB immigrants (Figure 7.2). The two levels of hierarchical regression were performed and labelled as Model-1 and Model-2. In Model -1, predictors related to the child's home context (Primary caregiver's Education level) and child's characteristics (self-esteem, school engagement, persistence in academic tasks, and non-verbal Intelligence (fmatreas-k10)) were included. In Model 2, the child's heritage culture context (Educational aspirations relative to those of peers in their heritage group) and host culture context (quality child-teacher relationship) context were included along with the child's home context and the child's characteristics. Model 2 is used to explain the applicability of Motti-Stefanidi's et al. (2012) framework "the immigrant youth adaptation context" within the children of NESB immigrants.

Model 1 showed the child's home context and child characteristic predictors together influenced their academic achievement in reading. The adjusted R squared of 0.27 ($p < 0.001$) indicated almost 27% of the variation in the reading achievement was explained by five predictors in Model 1. Model 2 showed that the total relationship for each home context; child characteristic; heritage and host culture context including their peer groups predictors influence their academic achievement in reading, The adjusted R-squared was increased by almost 4% in Model 2 (R-squared = 0.31, p=0.01) and showed that the guided framework was explained by 31% for overall academic achievement in reading. Primary caregivers higher education level (M1 = β = 37.67; p = 0.05; M2 = β = 33.70; p = 0.05), child's higher level of school engagement (M1 = β = 28.14; p = 0.05; M2 = β = 24.14; p = 0.05), child's higher levels of non-verbal intelligence (M1 = β = 8.96; $p < 0.001$; M2 = β = 8.05; $p < 0.001$) and heritage peer groups higher levels of educational aspiration relative to the target child (M2 = β = 39.27**; p = 0.01) contributed to increase academic achievement in reading performance of children of NESB immigrants.

Figure 7-2: Influenced redictors of academic achievement in reading performance

***p < 0.001; **p < 0.01; *p < 0.05

Factors in host culture context

Quality of the child-teacher relationship

M2 = -1.37

Primary caregiver's education level

Factors in home context

M1 = 37.67*
M2 = 33.70*

Mother's interest in education

M1 = -6.53
M2 = -11.23

M2 = 39.27**

Self-esteem

Child characteristics

School engagement

Persistence in academic tasks

Non-verbal intelligence

M1 = 0.002
M2 = 0.38

M1 = 28.14*
M2 = 24.14*

M1 = 12.23
M2 = 12.42

M1 = 8.96***
M2 = 8.05***

Educational aspirations relative to those of peers in their heritage group

Factors in the heritage culture context

Child's academic achievement in reading

Model 1 = 27***

Model 2 = 31.2**

R Square change= 0.05**

7.6 Discussion

This study aimed to identify the predictors as well as the applicability of Motti-Stefanidi's framework to explain academic achievement in reading performance among children of NESB skilled immigrants. Eight predictors were selected from the literature search and the guidance of the well-known framework "Immigrant youth adaptation in context" (Motti-Stefanidi et al., 2012). Hierarchical regression models were applied to explain the contribution of the selected predictors in reading performance and explain the applicability of the selected framework for examining academic achievement in reading in a distinctly different group. Children were selected from second-generation immigrant children, non-English speaking country and skilled immigrant backgrounds. Findings showed that the guided framework showed the significant variances in the reading performance of children of skilled immigrants from NESB after including heritage and host peer and cultural context related predictors along with parents and children's characteristics. Result displayed that the guided framework was explained the academic achievement in reading performance of Australian-born children of NESB immigrants. The primary caregivers education level, the child's school engagement, the child's non-verbal intelligence, and educational aspirations relative to peers in their heritage group were the strongest predictors of individual differences in reading performance. Previous research found a positive association between immigrant children's school engagement (Asendorpf & Motti-Stefanidi, 2017), educational expectations and non-verbal intelligence level (LSAC, 2014; Hao & Bonstead-Bruns, 1998; Rosenbaum & Rochford, 2008), and academic achievement of immigrant children. This study reveals that specific predictors related to the heritage culture recommended by the framework contributed to the independent variance of academic achievement in reading performance of children of skilled immigrants from NESB.

7.7 Strengths and limitations

A well-known framework was utilised as a guide of identified the influenced predictors associated with the children reading performance and did explore the applicability of this framework on a distinct group, that is a strong strength of this study. Initially, this study aimed to include children from 10 years of age. However, the expected predictors were not available in this age group. Consequently, this study included children

when they are 12 years old to explore the applicability of the framework for this group. Education aspiration of children and their parents' aspiration about their education was not available in the 10 years of the dataset. Selecting data from the 12-year-old cohort introduced some limitations. For instance, some predictors identified in previous literature were not available for the chosen group of 12-year-old children. Unfortunately, parents' education aspirations for the child had a ceiling effect and dropped off from the selected data. "Education expectation of parents in heritage group" was excluded for the same reason. The variable "parents' status as skilled or unskilled immigrants" was dropped due to the unavailability of enough samples in each group. Due to insufficient individual differences for the outcome of children of skilled immigrants from NESB; insufficient statistical power (a smaller sample); insensible measurement - too few items with a smaller number of rating alternates; cultural issues – it may not be relevance to the child's cultural understanding. These limitations could contribute differently to their predictors of explanation of academic achievement in reading performance, because changing one single limitation could lead to different findings.

7.8 Conclusion

Motti-Stefanidi et al. (2012) "Immigrant youth adaptation in context" model explained the additional variance of children's academic achievement in reading performance. The primary caregivers education level, child's school engagement, child's non-verbal intelligence, and heritage peer group's educational aspiration relative to the target child were the strongest predictors of individual differences in reading performance. Despite the limitations, this is an exceptional finding compared to previous research which could be used as a guide for future research and implication for policy and practice makers. This study focused specifically on second-generation immigrant children, skilled immigrant and non-English speaking country backgrounds and informed by a well-known framework to explain the applicability of a new group's adaptation which is unique in the field in that respect. A few factors concerning immigration policy and resettlement procedures are proposed to contribute to this pattern of findings which requires further research.

CHAPTER 8 — STUDY FIVE: PREDICTORS ASSOCIATED ACADEMIC ACHIEVEMENT IN NUMERACY PERFORMANCE

8.1 Overview

Children's academic achievement was examined as an indicator of their adaptation to the host country's educational system, with a focus on numeracy performance. Numeracy performance was selected because it is less dependent on language skills. It was anticipated that children of skilled immigrants NESB would demonstrate stronger numeracy performance compared to their reading performance. In Study One, although children of NESB immigrants achieved higher scores in numeracy performance than children of native-born skilled parents and children of ESB skilled immigrants, there was a considerable individual variability within the NESB group performance. For instance, almost 14% of children of NESB skilled immigrants belong to the lower fourth quartile in numeracy scores compared to the children of native-born skilled parents, and 13.9% compared children of ESB skilled immigrants.

There was considerable variability in academic achievement in numeracy performance among children of skilled immigrants from NESB. This variability in numeracy performance may occur from different predictors that can account for individual differences of their academic achievement. Therefore, this study aimed to identify predictors that influence individual differences or variances in numeracy performance among children of skilled immigrants from NESB. In addition, this study was guided by "The Immigrant Youth Adaptation in Context" framework proposed by Motti-Stefanidi's et al. (2012) to assess the applicability of this framework in this new group where children were distinctly second-generation children of skilled immigrants from NESB. The selection of predictors for numeracy performance was guided by previous research, which focused on predictors at the interaction and child levels with Motti-Stefanidi et al.'s framework. The framework suggests that predictors at the societal level have their influence on adaptation via their influence on predictors at the interaction and individual child levels.

8.2 Selecting predictors associated children academic achievement in numeracy performance

The same set of eight predictors was chosen to investigate the factors contributing to the individual differences in academic achievement in numeracy performance among children of NESB skilled immigrants, similar to the approach taken for reading performance. The rational of selecting these, which are associated with both reading and numeracy performances, have been explained in the overview of Study Four and is displayed in Figure 7.1 (Chapter 7).

8.3 Research aims

Aim-I: To identify the predictors that account for individual variances on academic achievement in numeracy performances of second-generation children of skilled immigrants from NESB at aged 12 years in Australia.

Aim-II: To extent and test the applicability of the theoretical framework the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) to the academic achievement in numeracy performance of second-generation children of skilled immigrants from NESB at aged 12 years to Australia.

8.4 Hypothesis

4. At the age of 12 years, the NAPLAN reading, and numeracy scores would be negatively correlated with
   - self-esteem.
1. At 12 years, the NAPLAN numeracy scores of second-generation children of NESB skilled immigrants would be positively correlated with
   - primary caregiver's education level
   - mother's interest in education
   - positive relationship with their main teacher
   - educational aspirations relative to those of peers in their heritage group
   - school engagement
   - persistence in academic tasks and
   - Non-verbal intelligence.

2. The research model depicted in Figure 8.1 would explain a significant amount of variance on academic achievement in numeracy performance of second-generation children of skilled immigrants at the age of 12 years.

8.5 Methodology

This study examined the "academic achievements in numeracy" of 12-year-old children of immigrants in Australia. Similar to other studies, this study utilised archival datasets, specifically "the longitudinal Study of Australian Children (LSAC),"and the National Assessment Program-Literacy and Numeracy (NAPLAN) to extract the child's academic achievement scores in numeracy performance. The NAPLAN scores were integrated with the LSAC dataset by matching the child's unique identification number. The details of these two datasets are described in Chapter 2 and Chapter 7 in this thesis.

8.5.1 Database, "The Longitudinal Study of Australian Children (LSAC)"

Similar to the other studies, this study extracted the data from the "Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC) archival dataset. Details would be found on previous chapter's method sections and in Chapter Two.

8.5.2 Participants

Just like in Studies Three and Four, this study also involved selecting the same group of children from NESB immigrant families within the LSAC dataset. These children were chosen as participants for this study, which aimed to investigate individual variations in academic achievement in numeracy performance in Australia. The same criteria for inclusion, as detailed in Table 6.1, were applied, and the number of participants remained consistent, as shown in Table 6.2.

8.5.3 Measurements of outcome variables

Academic achievement in numeracy skills

NAPLAN score was used to assess the children's academic skills in numeracy performance. NAPLAN is an annual assessment program that administered in Australia to students in Years 3, 5, 7, and 9. NAPLAN test were usually conducted in classrooms during school hours over a specific period, typically spanning three days. It was designed to assess

students' literacy and numeracy skills and provide a snapshot of their progress in these areas. This study focused on Year 7 numeracy skills of children of skilled immigrant from NESB. Numeracy questions cover topics such as number sense, algebra, measurement, geometry, and statistics. Students must solve problems and apply mathematical concepts. The tests use a combine response formats to assess students' skills: Multiple-choice questions, short-answer questions, and extended-response questions required students to solve problems and show their working. Generally, students received full marks for a correct answer. However, in some cases where the working steps were required to reach the answer, partial credit might have been given if the working was correct, even if the final answer was not. NAPLAN accesses the performance of children from 0-1000 in numeracy. 0 represents the lowest score and 1000 is the highest score. These raw scores were then standardized to form scale scores. To aid the interpretation of scale scores, these were classified into bands, with higher scale scores being assigned to higher bands. Band 4 represents the minimum level of numeracy skills necessary in Year 7, for a successful transition to Year 8. Following Table 8.1 shows the scale score range for each band for numeracy assessments in Years 7. Blue font was used to differentiate the national average scores and Band in numeracy performance according to Year 7 level (NAPLAN, 2019).

Table 8.1: NAPLAN Numeracy scale score equivalence to a band in year 7(2012)

Year 7(2012)	
Numeracy	
Scale score	Band
172.9 – 421.4	4
428.9 –475.1	**5**
481.1 - 527.0	6
532.7 - 578.7	7
584.7 - 630.6	8
637.9 - 922.8	9

8.5.4 Measurement of predictors associated with academic achievements in numeracy Performance

Similar to the approach taken for reading performance, this study also considered the same set of eight predictors to explore the individual variances in academic achievement in numeracy performance among children of NESB immigrants' academic achievement in numeracy performance. The details of how these eight predictors were measured and selected have already been discussed in Study Four in Chapter 7.

8.5.5 Analysis plan

Data management and statistical analyses were performed using SPSS version 25 (IBM Corp, 2017). A complete case analysis was performed due to the small number of missingness.

Data normalities were visually checked using frequency histograms and normal Q-Q plots. Kolmogorov-Smirnov Test was used to assess the normality. If the continuous variables were not normally distributed, the transformation of the variables was performed, or the non-parametric statistical approaches were used. In addition, any outliers were identified, and analyses were undertaken to determine the impact the outliers have on skewing the data.

Means and standard deviations (SD) for discrete and continuous data were calculated and categorical variables were presented as percentages. If there were insufficient numbers in each cell, the cells/categories would be collapsed or there would be a notation that the group results in each of the cells were based on small numbers and therefore should be treated with caution. For non-normally distributed data, median and interquartile ranges (IQR) were reported.

Scatterplot was drawn to visually examine the relationship between the independent and dependent variables. To meet the data requirements, both Pearson's product-moment correlation and Spearman's rank correlation were employed to evaluate the association between the predictors and academic achievement in reading. Specifically, the Pearson correlation coefficient was computed for numeric predictors, while the Spearman's rank correlation coefficient was calculated for predictors with an ordinal nature.

Hierarchical regression models were used to examine the net effects of predictors through the guidance of Motti-Stefanidi et al. (2012), the "Immigrant Youth Adaptation in Context" framework. Initially, a univariate analysis was undertaken for each predictor and then followed by a multivariate analysis. To undertake the multivariate analysis, this study built the model that best predicts the values of the dependent variable using one or more predictors. A general linear model allows the inclusion of continuous and categorical predictor variables. The linearity assumption was checked between numerical predictors and the academic achievement scores obtained from the NAPLAN database. To assess the model goodness of fit, an adjusted R-squared value was computed, which measures the proportion of the variance in the numeracy performance scores that can be accounted for by the independent predictors. In undertaking statistical analyses, this study is likely to use a conservative $P < 0.05$ to assist with the interpretation of whether the results were of a magnitude sufficiently large to be meaningful.

8.6   Result

8.6.1   Overview of the selected predictors, correlation, and Univariate Regression

At the outset, this study aimed to provide a detailed description of each predictor, assess the correlation between each of the predictors and the outcome to see the distribution of the data and the relationship of each selected predictor with the academic achievement in numeracy skills. Subsequently, the simple linear regression model was employed to reinforce the insights gained from the correlation analysis. Finally, a two-step hierarchical regression models were performed to determine the net influence of the predictors on academic achievement in numeracy performance. The findings were comprehensively discussed and overviewed by highlighting distinct information (Table 8.4) and the primary discoveries of this study (Figure 8.2).

8.6.2   Predictors related to child's academic achievement in numeracy performance.

Details of each predictor associated with individual variances in academic achievement in numeracy performance among children of NESB skilled immigrants are discussed below. Furthermore, Table 8.4 presents the correlation and univariate regression

results for children's academic achievement in numeracy performance by selective predictors.

Extra-familial heritage cultural context:

Target children's educational aspirations relative to those of peers in the heritage culture group

In total, 217 (97%) parents provided responses regarding their heritage peer group's educational aspiration relative to the target child level, with minimal missing values from 2% of the 218 participants. The table showed that 178 (82%) heritage peers had either an equal or lower level of academic aspiration related to their target child, while 39 (18%) expressed higher level of academic aspiration relative to their target child of NESB skilled immigrants. Due to the ordinal nature of this data, Pearson's rank correlation was used to examine the relationship between "heritage peer groups educational aspiration relative to the target child" and children's academic achievement in numeracy. The correlation analysis found a significant (ρ = 0.29, p < 0.001) relationship between these two variables. As the level of academic aspiration increased, there was a corresponding rise in their numeracy scores in academic achievement in increased too. In the regression model, two categories were utilised: low and high levels of academic aspiration, with the low level considered the reference group. According to the results of the simple linear regression model, children's numeracy scores showed an increase of 69.0 points (β = 69.0, p < 0.001) when the educational aspiration level of the heritage peer group was high in comparison to the low level of educational aspiration relative to the target child.

Home context:
Primary caregiver's Education Level

Of 218 participants, 204 (93.6%) parents provided information regarding their education level, with only 14 parents (6.4%) having missing data. Among them, 180 (88.2%) primary caregivers completed an advanced diploma/diploma or higher level of education, and 24 (11.8%) primary caregivers completed a certificate or other levels of education. The data related to the education level of primary caregivers is in ordinal format, leading to the utilization of Spearman's rank correlation analysis. The analysis found a substantial positive correlation (ρ = 0.17, p = 0.023) relationship between their primary caregivers' education level and academic achievement in numeracy. In other words, as the educational

attainment of parents increased, so did the children's numeracy proficiency. The simple linear regression model suggested that the child's reading score was increment by 10.86 units (β = 8.8, p = 0.05)) for every unit increment of primary caregiver education level. The linear regression model employed two categories: low and high levels of education of primary caregivers, with the low level being used as the baseline. Based on the outcomes from the simple linear regression model, the numeracy scores were increased by 39.7 points (β = 39.7, p =0.074) when the educational level of the primary caregivers was high compared to the low level of education (β = 39.7, p =0.074). Although this predictor did not show statistically significant, this variable is important for this study from a theoretical perspective.

Mother's interest in education

Of 218 participants, 213 (97.7%) parents provided responses regarding their education level, with minimal missing values from 5 parents (2.3%). Among them, 154 (72.3%) mothers showed a lot of interest in education and 59 (27.7%) mothers showed some interest to no interest at all. As the type of data of mother's interest in education is in ordinal format, Spearman's rank correlation analysis was conducted and found no considerable relationship between their mother's interest in education and academic achievement in reading (ρ=-0.08,p=0.271). The simple linear regression model also supported the findings from correlation analysis (β = -22.13, p=0.156). Although this predictor did not show statistically significant, this variable is important for this study from a theoretical perspective.

Host cultural context:
Quality of the child-teacher relationship

Out of the total participants, 208 (95.4%) children provided responses about the quality of the child-teacher relationship, with 10 cases having missing data. Only 45 (21.8%) children reported scores up to 20, while a majority of children (163, 78.2%) rated their teacher relationship as either 21 or higher. The majority of children from NESB immigrants expressed high-quality relationships with their teachers. Pearson's correlation analysis was used, because of the numerical nature of the data, and found no significant correlation (r=-0.08, p=0.394) between the quality of teacher-child relationship and the academic performance in numeracy among children of NESB immigrants. Similarly, the simple linear

regression model did not identify any significant relationship (β=-2.02,p=0.127) between these two variables. Nevertheless, this predictor was incorporated into the theoretical framework due to its theoretical importance in explaining children's academic achievement in numeracy performance.

Child's characteristics
Self-esteem

In total, 213 (97.7%) children provided responses regarding their level of self-esteem, with only 5 (2.3%) children having their missing data. It was found that 159 (74.6%) children scored their self-esteem 20 or above, while only 54 children (25.4%) reported their self-esteem level 19 or less among children of NESB immigrants. To examine the relationship between their self-esteem levels and their academic proficiency in numeracy skills, Pearson correlation analysis was employed. However, the analysis did not reveal a significant correlation (r=-0.01, p=0.907). Nevertheless, this predictor was included in the final analysis due to its theoretical importance.

School engagement

Of 218 children analysed, 164 (75.2%) parents provided responses regarding their school engagement level, with 54 (24.8%) cases had missing values. Notably, 151 (92.2%) children reported their school engagement level above three and a half, with only 13 (7.8%) children expressed their school engagement level three and a half or lower. Importantly, no child scored below 2.30 among children of NESB immigrants. The Pearson correlation coefficient showed that there was a significant positive relationship between their level of school engagement and their academic achievement in numeracy (r = 0.24, p = 0.005). The simple linear regression supported the significant relationship between these two variables. The coefficient (β = 40.94, p = .006) showed that the academic achievement in numeracy scores was increased by 40.94 for each unit increase of their level of positive school engagement.

Persistence in academic tasks

Of 218 participants, 210 (96.3%) children provided responses on their level of persistence with their academic tasks with minimal missing values from only 8 children (3.7%). Among these children of NESB skilled immigrants, It was found that 167 (77.7%)

children scored their persistency level above three, while only 47 (22.4%) children expressed their academic persistence level three or less among children of NESB skilled immigrants. Pearson correlation analysis found that there was a significant positive relationship between their level of persistence in academic tasks and their academic achievement in numeracy ($r = 0.24$, $p = 0.005$). The simple linear regression supported the significant relationship between these two variables. The coefficient ($\beta = 32.43$, $p < 0.001$) showed that the academic achievement in numeracy scores was increased by 32% for each unit increment of their level of persistence in numeracy tasks.

Non-verbal Intelligence (fmatreas-k10)

Of 218 participants, 200 (91.7%) provided responses regarding their level of non-verbal intelligence skill, with only 18 cases (8.3%) having missing values. Non-verbal intelligence was measured using the sub-test of the Wechsler Intelligence Scale (WISC-IV) (Wechsler, 2003) for children at 10 years. Their non-verbal intelligence score was numerically assessed using a scoring system. Pearson correlation analysis found a significant ($r = 0.62$, $p < 0.001$) relationship between their level of non-verbal intelligence and their academic achievement in reading. In other words, As their non-verbal intelligence level rose, there was a corresponding increase in their academic performance in numeracy skills. The linear regression model suggested that the child's numeracy score was significantly increased by 19.49 ($\beta = 19.49$, $p < 0.001$)) for every unit increment of the child's non-verbal intelligence.

Table 8.2: Correlation and univariate regression models for child's academic achievement in numeracy by selective predictors

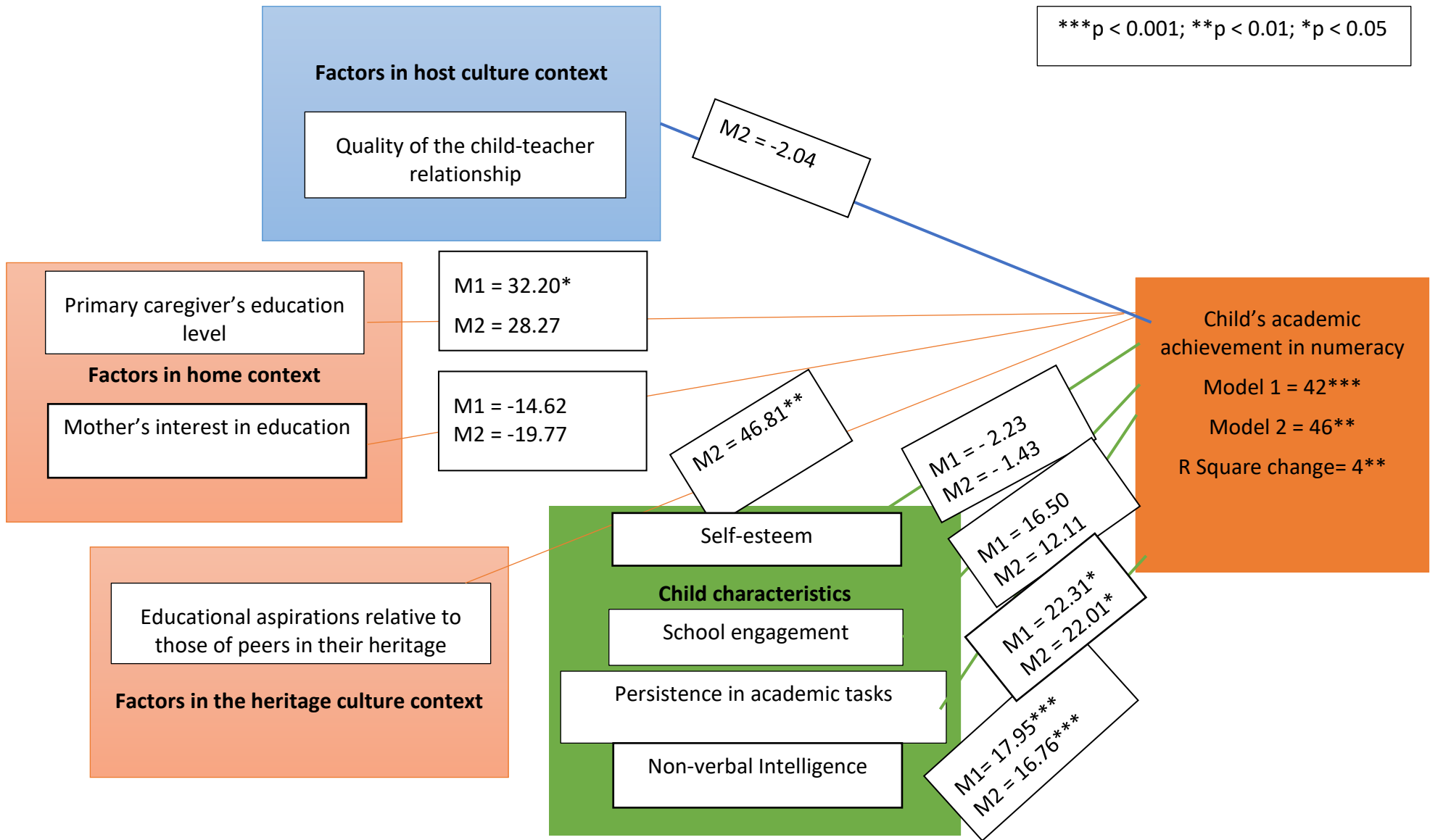| Predictors	Pearson Product Moment/ Spearman's rank-order correlation		Univariate linear regression models		
	Coefficient (r/ρ)	P value	Coefficient (β)	(95% CI)	P value
Educational aspirations relative to those of peers in their heritage group	0.30	<0.001	69.0	(35.25, 102.76)	<0.001
Primary caregiver's education level	0.15	0.041	39.74	(-3.96, 83.45)	0.074
Mother's interest in education	-0.14	0.055	-22.13	(- 52.79,8.52)	0.156
Quality of the child-teacher relationship	- 0.08	0.394	- 2.02	(-4.62 - .58)	0.127
Self-esteem	- 0.01	0.907	- 1.14	(- 5.80 – 3.52)	0.630
School engagement	0.24	0.005	40.94	(11.74 – 70.14)	0.006
Persistence in academic tasks	0.24	0.005	32.43	(14.74 – 50.11)	<0.001
Non-verbal Intelligence	0.62	< 0.001	19.49	(16.15 – 22.83)	<0.001

8.7 Hierarchical regression models

8.7.1 Overall findings of academic achievement in numeracy skills

Two-step multivariate hierarchical regression models were applied to examine the relationship between the predictors described above and children's academic achievement in numeracy performance of children of NESB skilled immigrants (Figure 8.1). The two steps were labelled as Model 1 and Model 2. Predictors were relevant to the child's home context (primary caregiver's education level) and child's characteristics (self-esteem; persistence in academic tasks; school engagement; and non-verbal Intelligence (fmatreas-k10) were included in Model 1. In Model 2, the child's heritage culture context (Heritage peer group educational aspiration relative to the target child) and host culture context (quality child-teacher relationship) were included along with the child's home context and child's characteristics from Model 1. The combination of predictors in Model 2 explained whether the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi's et al., 2012) framework was applicable to the children of NESB immigrants or not.

The details of the findings addressed in Figure 8.1, Model 1, showed that the total relationship for each home context and child characteristic predictors influenced their academic achievement in numeracy performance. The total adjusted R-squared (Adjusted R-squared = 0.42, p<0.001) described that Model 1 was explained by almost 42% variability by the predictors of home context and child's characteristics. Model 2 showed the total relationship for each home context; child characteristic; heritage and host culture context including their peer group predictors influence their academic achievement in numeracy (Figure 8.1). The R-squared increased by 0.4 (Adjusted R-squared = 0.46, p = 0.01) indicating that there was a benefit of including heritage and host cultural-context related predictors (Heritage peer-group educational aspiration relative to the target child, and quality child-teacher relationship) in Model 2 child's persistence in academic tasks (M1 = β = 22.31; p = 0.02; M2 = β = 22.01; p = 0.02); child's non-verbal intelligence (M1 = β = 17.95; p < 0.001; M2 = β = 16.76; p < 0.001) and heritage peer groups educational aspiration relative to the target child (M2 = β = 46.81; p = 0.007) predictors contributed to increasing academic achievement in numeracy performance of children of NESB skilled immigrants. So, the substantial R-squared change in Model 2 and, Study Five results showed that the guided

framework explained the overall academic achievement in numeracy performance of children of skilled immigrants from NESB.

Figure 8-1: *Influenced predictors of academic achievement in numeracy*

***p < 0.001; **p < 0.01; *p < 0.05

Factors in host culture context

Quality of the child-teacher relationship

M2 = -2.04

Factors in home context

Primary caregiver's education level

M1 = 32.20*
M2 = 28.27

Mother's interest in education

M1 = -14.62
M2 = -19.77

Factors in the heritage culture context

Educational aspirations relative to those of peers in their heritage

Child characteristics

Self-esteem

School engagement

Persistence in academic tasks

Non-verbal Intelligence

M2 = 46.81**

M1 = - 2.23
M2 = - 1.43

M1 = 16.50
M2 = 12.11

M1 = 22.31*
M2 = 22.01*

M1 = 17.95***
M2 = 16.76***

Child's academic achievement in numeracy

Model 1 = 42***

Model 2 = 46**

R Square change= 4**

201

8.8 Discussion

This study aimed to identify the predictors and the applicability of a well-known framework by Motti-Stefanidi explaining the individual variances on academic achievement in numeracy performance of children of NESB immigrants. Predictors were selected from previous research and through the guidance of a framework the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012). Two steps (Model 1 and Model 2) of multivariate hierarchical regression models were used to assess the contribution of the selected predictors. Regarding the explanation and examine the applicability of the selected framework to explain the academic achievement in numeracy in a distinctly different group. This children group was second-generation, NESB, and skilled immigrant backgrounds. In the findings, The significant variances were found from the analysis of hierarchical regression after including heritage and host peer and context predictors with the parents and child characteristics. It showed that the guided framework was explained the academic achievement in numeracy performance of Australian-born children of NESB immigrants. Child's persistence in academic tasks, child's non-verbal intelligence, and educational aspirations relative to peers in their heritage group were the strongest predictors of individual differences in numeracy performance. Consistent results found in child's higher education expectation and non-verbal intelligence level (LSAC, 2014; Hao & Bonstead-Bruns, 1998; Rosenbaum & Rochford, 2008) in regard to children of immigrants' higher levels of academic achievement. Bumgarner et al. (2013) found child persistence in academic task influenced children's mathematics performance. This research reveals in the current situation, specific predictors related to the heritage culture recommended by the framework have contributed to independent variance of academic achievement in numeracy performance of children of NESB immigrants. Therefore, this variance explains the framework "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012) applicability to explain the individual variability of children of NESB immigrants.

8.9   Strengths and limitations

At the beginning of the thesis, this study aimed to include children from 10 years. However, the selected desired predictors from the literature search and guidance from the theoretical framework were not available at 10 years. In this context, this study included children when they were 12 years old to satisfy the predictors from the previous research and from the theoretical framework. Such as education aspiration of children and their parents' aspirations about their education was not available in the dataset for children of 10 years old. There are some limitations in the sample for children 12 years of age. Previously selected predictors were excluded from the current study due to the unavailability and floor and ceiling effects. For example, parents' education aspirations for the child had a ceiling effect and were excluded from the Models. "Education expectation of parents in heritage group" was excluded because of the same ceiling effect. The study excluded data from groups with small sample sizes based on "parents' status as skilled or unskilled immigrants."

8.10 Conclusion

The "Immigrant Youth Adaptation in Context" framework proposed by Motti-Stefanidi et al. (2012) was utilised to explain the independent variances of selected children's academic achievement in numeracy performance. Reduce a limitation related predictors may contribute to the explanation of their individual variances differently, because changing one single limitation could lead to different findings. Despite some limitations, this study revealed four individual significant predictors contributed to explain the variances in numeracy performances of children of NESB immigrants. These findings could be used as a guide for future research and implication for policy and practice makers. Notably, this study had a specific focus on second-generation children with skilled immigrants and non-English-speaking backgrounds and was informed by a well-known framework to assess the applicability of this well-established in understanding the adaptation in this new group, adding a distinctive perspective to the field.

CHAPTER 9—DISCUSSION AND CONCLUSION

9.1 Discussion

This thesis focused on the adaptation of second-generation children of skilled immigrants from NESB in Australia. It focused on children's adaptation to emotional and behavioural problems and academic achievement in two core areas, reading and numeracy performance. The thesis comprised five quantitative studies to explore the adaptation of children of NESB immigrants. Two nationally representative databases (LSAC and NAPLAN) were used for all five studies. Study One explored the levels of their two adaptation areas compared to the two other groups: children of ESB immigrants and children of native-born parents at three ages 10, 12, and 14 years of age. Moreover, it examined the immigrant status and language effects on children's adaptation levels. This thesis compared two immigrant groups (children of NESB and ESB skilled immigrants) with children of native-born skilled parents to see the immigrant status effect on the emotional and behavioural problems and academic achievement of both immigrant groups' children. It compared children of NESB immigrants with children of ESB immigrants to explore the effect of language status on children of skilled immigrants' adaptation in both areas. Study Two examined longitudinal changes among the same groups on the same outcomes in all three age levels. Studies Three, Four, and Five identified specific predictors related to children's characteristics and their developmental context that contributed independent variance to measures of adaptation in both areas among children of NESB skilled immigrants using the "Immigrant Youth Adaptation in Context" framework (Motti-Stefanidi et al., 2012).

This thesis found that children of NESB skilled immigrants in Australia were thriving. They have consistently demonstrated better emotional and behavioural health and academic achievement in reading and numeracy performance compared to children of ESB immigrants, and children of native-born parents. The thesis revealed that there is a marked difference in comparison with the persistent evidence of disadvantage widely reported in the USA and Western Europe (Motti-Stefanidi et al, 2008; Stevens et al., 2015). This final

chapter discusses the thesis's findings in the context of the extant literature, highlighting contributions to the body of knowledge. It concludes with future research, policy, and practical implications.

9.1.1   Emotional and behavioural problems

Study One examined the group differences on emotional and behavioural problems of children of NESB immigrants compared to children of ESB immigrants, and children of native-born parents. One key finding of this thesis was that children of NESB skilled immigrants exhibited lower emotional and behavioural problems compared to children of native-born parents and children of ESB immigrants. It was not significantly lower, which represented similar levels of emotional and behavioural health among the three children groups. This study did not examine immigrant status and language status effect further because of no differences among three groups' emotional and behavioural problem levels. None of the groups showed emotional and behavioural problems scores above the borderline or clinical cutoff point. This pattern of outcome on emotional and behavioural problems continues at the ages of 10, 12, and 14 years. The finding is a marked contrast with the previous literature (e.g., Motti-Stefanidi et al., 2008). Details of the findings of emotional and behavioural problems according to the longitudinal effects and influenced predictors on emotional and behavioural problems of children of NESB immigrants are discussed below.

Longitudinal effect

The second study conducted a longitudinal study to explore the longitudinal changes of emotional and behavioural problems at the ages of 10 years, 12 years, and 14 years. These longitudinal changes of emotional and behavioural problems were examined for children of NESB immigrants and compared to children of ESB immigrants, and children of native-born parents. This study selected the same participants who were available in all ages. It was hypothesised that the longitudinal changes of emotional and behavioural problems of children of NESB immigrants would be unfavourable or negative from 10 years

205

of age to the following two ages at 12 years and 14 years of age. Similar changes would be observed compared to the other two other groups: children of ESB immigrants and native-born parents from 10 years to 12 years, and 14 years of age.

The outcome does not support the hypothesis. It showed the improvement of emotional and behavioural well-being over the span of 10 years to subsequent ages (12 years and 14 years) which displayed a favourable trend. In particular, they have displayed a similar or lower level of emotional and behavioural problems at 12 years, and 14 years, compared to 10 years of age. They have demonstrated similar findings through group comparison involving children of native-born parents and children of ESB immigrants from 10 years to 12 years, and 14 years of age. In conclusion, the findings of this study clearly showed that the children of NESB immigrants in Australia showed positive longitudinal changes of adaptation in terms of emotional and behavioural outcomes.

Predictors of emotional and behavioural problems

The third study explored the evidence-based explanation of influenced predictors on adaptation patterns and independent variance of children of NESB immigrants' emotional and behavioural problems. It was guided by previous research and a well-known framework the "Immigrant Youth Adaptation in Context" (Motti-Stefanidi et al., 2012). The study aimed to identify the predictors as well as the applicability of Motti-Stefanidi et al's framework explaining independent variances of children of NESB skilled immigrants' adaptation of emotional and behavioural problems. The study observed them when they were 12 years, at their transition from primary school to secondary school. Hierarchical regression models were applied to explore the contribution of the selected predictors. The result found that four out of six selected predictors were significant and Motti-Stefanidi's framework explained the emotional and behavioural problems of this distinct group.

The four predictors were "self-esteem," "reactivity," "victimisation experienced by the target child relative to that experienced by peers in the host culture group," and "quality of the child-teacher relationship". The results showed that higher levels of child's

self-esteem were associated with their lower levels of emotional and behavioural problems in children of NESB skilled immigrants. This is consistent with previous research which found a positive relationship between children's self-esteem and emotional and behavioural problems (Motti-Stefanidi et al., 2012; Nakash et al., 2012). Higher levels of negative reactivity or temperament increased the emotional and behavioural problems of children of NESB immigrants. Children's peer predictors also influenced their emotional and behavioural problems. Children of NESB immigrants' emotional and behavioural problems increased when host peers suffered more bullying victimisation relative to that experienced by peers in the host culture group. Their quality of relationship with their teacher from the host context influenced their emotional and behavioural problems. The higher levels of quality child-teacher relationship decreased their emotional and behavioural problems considerably. These findings demonstrate that Motti-Stefanidi's framework was applicable to explain the emotional and behavioural problems of children of NESB skilled immigrants.

9.1.2   Academic achievement in reading performance

The first study showed a similar or higher level of academic achievement in reading among children of NESB immigrants compared to children of ESB immigrants and children of native-born parents. This trend was consistent across three age groups: 10 years, 12 years, and 14 years, with all three groups surpassing the national average reading scores in Australia. This fundings contrast with previous research, which showed that second-generation immigrant children had lower levels of academic achievement compared to children of native-born parents (Bodovski & Durham, 2010). The findings are elaborated upon in four areas: immigrant status, language status, and longitudinal effects and influenced predictors on academic achievement in the reading performance of children of NESB immigrants.

Immigrant status effect

To investigate the effect of immigrant status on academic achievement in reading performance, Study One compared two immigrant groups (children of NESB and ESB skilled

immigrants) with children of native-born skilled parents. It was hypothesised that reading performance among children of skilled immigrants from NESB and ESB would be higher than that of children of native-born skilled parents. Both immigrant groups did not demonstrate lower academic achievement in reading performance compared to non-immigrant children at 10 years, 12 years, and 14 years of age. They either have shown similar or higher scores in reading performance than non-immigrant peers. These findings supported the hypothesis, indicating that there was no detrimental immigrant status effect on the academic achievement in the reading performance of children of NESB and ESB immigrants. This aligns with previous research that used data from PISA (Akther & Robinson, 2014) and NAPLAN (Islam et al., 2022), which also found higher reading scores among second-generation immigrant children than children of native-born parents. Their research focused on immigrant host country backgrounds such as Australia, New Zealand, Canada, and Singapore. In contrast, previous research showed a lower grade point average among children from immigrant backgrounds than children of native-born parents (Motti-Stefanidi et al., 2008; OECD, 2012). Previous research in the USA and Europe found that second-generation immigrant children had a lower level of adaptation or outcomes than first-generation immigrant children or native children (e.g., Coll & Marks, 2012). Nonetheless, such patterns of immigrant disadvantage were not evident in the findings of this thesis. Consequently, the results did not show any pattern of the immigrant status-related disadvantage in the academic achievement of children from NESB and ESB immigrants, specifically in terms of reading performance.

Language effect

In Study One, this thesis explored the effect of language status on academic achievement in reading performance of children of NESB immigrants by comparing them with children of ESB immigrants. It was hypothesised that reading performance among children of skilled immigrants from NESB would be higher than that that of children of ESB skilled immigrants. However, the findings revealed that children of NESB immigrants have exhibited higher scores in reading performance compared to the children of ESB immigrants

at 10 years, 12 years, and 14 years of age. The different scores were not significantly higher in all ages. This indicates that both groups of immigrant children exhibited similar levels of reading performance. The reading scores of children of NESB immigrants' were not lower at any age compared to children of ESB immigrants. Reading performance primarily relies on language skills, and children of ESB immigrants have greater chances to excel because they have more exposure to and proficiency in the host language. However, these findings contrast with previous research, which showed a disadvantage for children of immigrants who had limited proficiency in the host language (e.g., Toppelberg et al., 2010). Children of NESB immigrants did not experience any disadvantages despite not having English as their primary home or heritage language.

Longitudinal effect

Longitudinal changes in academic achievement in reading performance among children of skilled immigrants from NESB were examined in the second study. The longitudinal changes were observed from 10 years to 12 years and 14 years of age and compared these changes to those in children of ESB skilled immigrants and native-born skilled parents. The study hypothesised that the longitudinal changes of academic achievement in the reading performance of children of NESB immigrants would be positive within themselves and compared to children of ESB immigrants and native-born parents from 10 years to 12 years, and 14 years of age.

The findings from Study Two supported the hypothesis. The longitudinal changes from 10 years to 12 years, and 14 years of age displayed a favourable trend. They have displayed higher levels of reading performance over the span of 10 years to subsequent ages (12 years, and 14 years). Moreover, when compared to children of native-born parents and children of ESB immigrants, they either displayed similar or higher scores in reading performance at the different age intervals (10 years, 12 years, and 14 years). In conclusion, the study results showed that the children of NESB immigrants in Australia exhibited positive longitudinal changes in the adaptation of academic achievement in reading performances.

209

Predictors of academic achievement in reading performance

The primary goal of Study Four was to isolate the predictors that had individual effects on the variation in reading performance among 12-year-old children with NESB skilled immigrant backgrounds. Additionally, the study sought to assess the applicability of Motti-Stefanidi et al.'s (2012) framework in this context. This was observed in children aged 12 years only, transitioning from primary school to high school. These children were second-generation immigrant children, originated from non-English speaking countries, and coming from skilled immigrant backgrounds. Predictors were selected based on prior research and guided by the framework of "Immigrant Youth Adaptation in Context" proposed by Motti-Stefanidi et al. (2012). Hierarchical regression models were applied to explain the contribution of the selected predictors associated with reading performance and explain the applicability of the framework to understand academic achievement in reading performance within this group. The findings showed that the framework, guided by the selected predictors , accounted for approximately 31% of the variance in reading performance, and the theory was applicable to this distinct group. Model 1 explains 27% of the variance and when the host and heritage contexts and peer-related predictors include with the parents" and child's characteristics predictors in Model 2, it explains 31% of the variance in their reading performance. This 4% increase was statistically significant.

Out of the eight predictors examined in the study, four individual predictors were found to be significantly associated with the variance of reading performance of children of NESB skilled immigrants. "Primary caregivers education levels," "school engagement," "non-verbal intelligence," and "educational aspirations relative to those of peers in their heritage group" were the strongest positive predictors of individual differences in reading performance. When each of these four predictors increased, children academic scores in reading performance also increased. E.g., child's highest level of school engagement and child's higher levels of non-verbal intelligence increased academic achievement in reading performance for children of NESB skilled immigrants. Previous research found a positive association between immigrant parents' higher education levels (Crosnoe & Turley, 2011;

Gillborn, 1997; Mok et al., 2016; Moon et al., 2009), children of immigrants' higher levels of school engagement and academic achievement (Asendorpf & Motti-Stefanidi, 2017). Children of immigrants with lower levels of school engagement can lead to a lower level of academic achievement compared to the children of native parents (Motti-Stefanidi et al., 2015). Consistent findings were found with child's higher education expectation and non-verbal intelligence level (LSAC, 2014; Hao & Bonstead-Bruns, 1998; Rosenbaum & Rochford, 2008). This study reveals that specific predictors related to the heritage culture and peer group recommended by the framework contributed to the independent variance of academic achievement in reading performance of the children of NESB skilled immigrants. Moreover, the findings demonstrated that Motti-Stefanidi's framework was applicable to explaining the independent variance of academic achievement in reading performance of children of NESB skilled immigrants.

9.1.3 Academic achievement in numeracy performance

The first study aimed to investigate group differences in the academic achievement of numeracy performance among children of NESB immigrants compared to children of ESB immigrants, and children of native-born parents. Academic achievement in numeracy performance was observed because its lesser focus on language volume than reading performance. It was expected that children will perform better in their numeracy scores than their reading scores. It was hypothesised that children would demonstrate higher scores in numeracy performance than other two groups. The results indeed supported this hypothesis, revealing that children of NESB immigrants achieved higher numeracy scores than both children of native-born parents and children of ESB immigrants. All three groups showed higher numeracy scores compared to the Australian national average scores across all three age periods. Details of the results of academic achievement in numeracy performance according to immigrant status, language status, and longitudinal effects and influenced predictors of independent variances on academic achievement in numeracy performance of children of NESB immigrants were discussed below.

Immigrant status effect

Study One examined the effect of immigrant status on academic achievement in numeracy performance by comparing both immigrant groups (children of NESB and ESB immigrants) with children of native-born skilled parents. This study hypothesised that the numeracy scores among both immigrant groups would be higher than children of native-born parents. The results supported the hypothesis and displayed higher scores among children of NESB- and ESB immigrants than non-immigrant children at 10 years, 12 years, and 14 years of age. Children of NESB immigrants demonstrated significantly higher scores in numeracy performance than children of native-born parents of all ages. Consistent result also found in previous research (Islam et al., 2022). The findings did not show any negative effects of immigrant status on their numeracy skills. While children of ESB immigrants did exhibit higher numeracy scores than children of native-born parents across all age groups, the difference was not statistically significant. They have displayed similar numeracy scores as children of native-born skilled parents at all three ages. Subsequently, both groups of immigrant children did not show lower scores than non-immigrant children. This finding contrasts with the majority of previous research which found a negative immigrant status effect on academic achievement (Anagnostaki et al., 2016; Motti-Stefanidi et al., 2015; Motti-Stefanidi et al., 2008; OECD, 2012; Suárez-Orozco et al., 2010). Furthermore, the findings from Study One were similar to some current research where immigrant children outperform non-immigrant children in numeracy performance (Islam et al., 2022; Akther & Robinson, 2014).

Language effect

In first study, this thesis compared the children of NESB immigrants with children of ESB immigrants to perceive the language effect on numeracy performance. It was hypothesised that numeracy performance among the children of NESB immigrants would be higher than the children of ESB immigrants. The results supported the hypothesis, no language effect was found for home language origin among children of skilled immigrants from NESB on numeracy performance compared to children of skilled immigrants from ESB.

The children of NESB immigrants exhibited higher scores in numeracy performance compared to children of ESB immigrants in all three ages. This finding was consistent with previous research by Islam et al. (2022). Their numeracy scores were significantly higher than children of ESB immigrants at 10 years, 12 years, and 14 years of age. However, these findings contrast with previous research that showed a disadvantage for children of immigrants with limited proficiency in the host language (e.g., Toppelberg et al., 2010). Overall, the findings demonstrated that language did not show any negative effect on academic achievement in the numeracy performance of children of NESB skilled immigrants.

Longitudinal effect

In the second study, a longitudinal study was conducted on academic achievement in numeracy performance for children of NESB immigrants. It examined longitudinal changes of children of NESB immigrants and compared them to children of ESB immigrants, and children of native-born skilled parents from 10 years to subsequent ages (12 years and 14 years). This study selected the same participants who were available in all ages in each group. It was hypothesised that the longitudinal changes of academic achievement in numeracy performance of children of NESB immigrants would be higher/positive. Similar trends would be found in numeracy performance of children of NESB immigrants compared to the other two counterparts: children of ESB immigrants and native-born parents from 10 years to 12 years, and 14 years of age.

The outcome supported the hypothesis. The longitudinal changes on academic achievement in numeracy performance demonstrated a favourable trend from 10 years to 12 years, and 14 years of age. In particular they have displayed higher scores on numeracy performance from 10 years to 12 years, and 14 years of age. Moreover, they have showed similar or higher levels of scores on numeracy performance through a group comparison comprising children of native-born parents and children of ESB immigrants from 10 years to 12 years, and 14 years of age. In contrast, most previous research In conclusion, studies found that children of immigrants were at a substantial academic disadvantage compared to non-immigrant children (Dustmann et al., 2012; Motti-Stefanidi et al., 2015; Thomas, 2009;

213

Schnell & Azzolini, 2015). This research was not longitudinal and did not focus on specifically second-generation immigrant children from skilled backgrounds. Furthermore, previous research showed that highly acculturated second-generation immigrant children have poorer outcomes than first-generation immigrant children) (e.g., Marks et al., 2014), which is marked contrast with this study findings. Overall, Study Two's findings have shown that the children of NESB immigrants in Australia showed positive longitudinal changes of adaptation in terms of academic achievement in numeracy.

Predictors related to academic achievement in numeracy performance.

Study Five examined the influences of predictors on independent variances on the adaptation of academic achievement in the numeracy performance of children of NESB skilled immigrants. The predictors selection was based on previous research and were guided by the "Immigrant Youth Adaptation in Context" framework developed by Motti-Stefanidi and colleagues (Motti-Stefanidi et al., 2012). The aims of the study were to find out significant predictors and the applicability of the selected framework to explain the independent variances of numeracy performance of children of NESB immigrants. This study observed children aged 12 years only, transitioning from primary school to high school. Two-step (Model 1 and Model 2) hierarchical multivariate regression models were used to assess the contribution of the selected predictors.

Regarding the explanation and examination of the applicability of the selected framework to explain the academic achievement in numeracy performance in a distinctly different group, this group of children was clearly defined as second-generation immigrant children of NESB skilled immigrant. Two steps (Model 1 and Model 2) of multivariate hierarchical regression models were used to assess the contribution of the selected predictors. The findings showed that the guided framework was explained in Model-1 with about 42% of the variance in numeracy performance, whereas in Model-2, it explained 46% of the variance in numeracy performance of children of NESB immigrants. A 4% variance was significantly increased in Model-2. This reveals specific predictors related to the heritage culture peer groups recommended by the framework contributed to independent

214

variance in academic achievement in numeracy performance. This determines the applicability of the selected framework to explain the variances of the numeracy performance of children of NESB immigrants. Out of eight predictors examined, three predictors contributed substantially to this group's numeracy performance: "persistence in academic tasks;" "non-verbal intelligence" and "educational aspirations relative to those of peers in their heritage group". These three predictors were the strongest predictors of individual differences in the numeracy performance of children of skilled immigrants from NESB. Previous literature reported a positive association between child's educational aspiration and non-verbal intelligence level (LSAC, 2014, Hao & Bonstead-Bruns, 1998; Rosenbaum & Rochford, 2008), and child's persistence (Bumgarner et al., 2013) with higher performance on their academic achievement.

Overall, this thesis's results did not show a pattern of the immigrant disadvantage. In contrast, previous research found that children of immigrants were disadvantaged in comparison to children of native parents in their adaptation (Motti-Stefanidi et al., 2008; Motti-Stefanidi, 2014; Motti-Stefanidi et al., 2015; Anagnostaki et al., 2016). They found that children of immigrants have lower levels of adaptation than non-immigrant children. Coll and Marks (2012) found that second-generation immigrant children had a lower level of adaptation than first-generation immigrant children or native children. In contrast, this thesis's results in Study One did not demonstrated any evidence that the effect of immigrant status and parents' home language led to a disadvantage in their emotional and behavioural problems and academic achievement in reading and numeracy performance at 10 years, 12 years, and 14 years of age. Study Two showed positive longitudinal changes among children of NESB immigrants in all three age levels.

As an immigrant host country, Australia has a settlement program for immigrant support. Australia showed its great support to immigrant families for supportive multiculturalism practice (e.g., Marks et al., 2018) as an immigrant host country that could lead to positive adaptation among children of immigrants. The aim is to promote, maintain, and increase support in family, community, and in the school environment. In order for

children of immigrants to cope with the host culture and language, they are encouraged to maintain their heritage culture. Australia has programs for English as a second language (ESL program) for non-English speaking countries background students at primary and secondary schools. Multicultural days and ethnic school parades are celebrated in Australia each year. Children of immigrants' emotional and behavioural problems (e.g., shame, feelings of failure, and rejection which may lead to alcohol use) can increase because of the negative reaction of the host community to them (Walsh et al., 2018). Promoting multiculturalism with an added value to heritage orientation could minimise those problems and maximise positive adaptation (Schachner et al, 2017). In school children celebrate harmony day to show positive multiculturalism. Parents are welcome and encouraged to share their cultural food, and students are encouraged to wear their traditional cultural dress. These strategies are thought to contribute benefits that improve academic life for both children of immigrants and children of native-born parents (Silveira et al, 2019).

9.2 Implications

The findings of this thesis demonstrated a marked contrast from the majority of previous research conducted on the adaptation of the children of immigrants, primarily those from the USA and European host country backgrounds. These findings have the potential to contribute to various aspects, guiding future research, validating theories, and informing policy and decision makers.

Firstly, the cohort of children was different from most previous research on the adaptation of the children of immigrants. Participants were selected from second-generation immigrant children whose home language was different from English and whose parents' background was skilled according to their highest education levels. Previous research mainly focused on a mixed group of children according to generation, parents' skill levels, or even parents' home language. Consequently, those studies predominantly encompassed either first-generation or pooled samples of first-and second-generation immigrant children. Furthermore, children from those studies primarily derived from either

unskilled or a combination of skilled and unskilled backgrounds. Majority of those study findings were not separated according to children heritage language backgrounds, e.g., children of immigrants whose parents share the language of the host country against those who do not (from English speaking and non-English speaking backgrounds). In this thesis, the group of children were selected carefully, specially drawn from second-generation children of skilled immigrants from non-English-speaking countries backgrounds. The findings from this thesis hold the potential to offer valuable support to researchers who intend to focus on the adaptation of this particular group of children in the future.

Secondly, this thesis was carried out within the context of Australia, which presents a distinct host environment when contrasted with the more conventional immigrant-receiving nations, such as Western European countries and the USA. Although disparities in academic achievement between children of immigrants and children of native-born parents are common in high-income countries, children of immigrants in Australia do not experience the same level of disadvantage observed in the USA and Western European countries (Anagonostaki et al. 2016). Considering its multicultural nature, Australia has established a policy promoting multiculturalism and a robust program for the settlement of immigrants. The immigrant support program in New Zealand closely resembles Australia's approach. Canada and Singapore also exhibit similar host environments. Findings from the PISA (Programme for International Student Assessment) dataset across Australia, New Zealand, Canada, and Singapore reveal that second-generation immigrant children performed better than non-immigrant children in academic outcomes in reading, numeracy, and science (Akther & Robinson, 2014). According to Level et al. (2008) in familiar immigrant-receiving countries e.g., in Australia, strict immigration laws contribute to the improved educational achievements of immigrant children.This distinct host context might serve as an additional explanation for the divergent outcomes presented in this thesis.

Secondly, this thesis is conducted in Australia, and it has a different host context compared to other traditional immigrant host countries, such as Western Europe and the USA. Although academic achievement gaps between children of immigrants and children of

native-born parents were common in high-income countries, immigrants in Australia do not experience the same disadvantage faced in the USA and Western European countries (Anagonostaki et al. 2016). Australia has a multicultural policy and a strong immigrant settlement program. New Zealand has the most comparable immigrant support program. Canada and Singapore follow a closer host context too. Findings from the PISA (Programme for International Student Assessment) dataset in Australia, New Zealand, Canada, and Singapore, indicate that second-generation immigrant children performed better in academic outcomes in reading, numeracy, and science (Akther & Robinson, 2014). According to Level et al. (2008) in familiar immigrant-receiving countries, strict immigration laws explain immigrant children's better educational performance. This different host context could be another reason for this thesis's contrasting findings.

Finally, the incorporation of specific framework elucidated the process of both internal and external adaptation for this novel group, encompassing aspects such as emotional and behavioural problems as well as academic achievement in reading and numeracy performance. This framework stands as a potential reference and can be used as a guide to explain the adaptation for this distinct group in future research also. Practicing multicultural policy in Australia may strengthen the same opportunity and importance to the children of immigrants as like as children of native-born parents. This approach could foster a sense of parity, underlining that all children, regardless of their immigrant or non-immigrant origins, are valued equally.

In addition, the findings could be considered by policymakers and practitioners in their work toward positive settlement or adaptation in children of immigrants in any immigrant host country. It is vital to promote the development and adaptation of children of immigrants within their families, schools, workplaces, and communities for new and better strategies, for the well-being of children of immigrants and the economic prosperity and social cohesion of the host country.

9.3   Strengths and limitations

This thesis enhanced its credibility through the execution of an attrition analysis, as accurately presented in Chapter 3. The primary objective of this analysis was to examine and evaluate any potential biases that could affect the longitudinal study's findings. The analysis encompassed several aspects, including the magnitude of attrition in all three groups and the demographic composition to uncover any sample biases and demographic changes across different age groups. Additionally, it explored the likelihood of performance bias resulting from sample attrition. This attrition analysis is a strong strength of this thesis exploration.

Furthermore, a robust set of archival data were used for this research purpose. While this dataset offered numerous advantages including nationally representative data as well as longitudinal data, it also imposed certain constraints based on the children group and study objectives. Consequently, researcher modified the selection of participants to ensure an adequate sample size. Initially, the thesis focused on children from South Asian skilled immigrant backgrounds. Upon the confirmation of the research proposal, when the researcher received the dataset, it become evident that the sample size was limited. As a result, this thesis opted to select samples from all available children of each available NESB country. Although the sample size was changed at the beginning of the study, it broadens the opportunity to know about more widen group. The number of available participants was a huge challenge for this dataset, but it is impossible to collect representative data from each state of Australia for a single researcher. In this context, the LSAC and NAPLAN datasets proved to be robust alternatives. Both datasets offered a valuable opportunity to undertake secondary analysis on nationally representative longitudinal data.

The primary focus of the thesis was to identify potential effects related to immigrant status, dominant language, parents' skill levels, and longitudinal factors of second-generation children of skilled immigrants. However, within the dataset, the number of participants related to children of NESB and ESB unskilled immigrants was not large enough

to explore the parents' skilled effect on adaptation through a comparative analysis of the group.

The unavailability of selected predictors posed an additional challenge for certain age groups. This challenge emerged after the group selection process, mainly due to the unavailability of selected predictors at 10 years of age. These predictors were chosen based on established guidelines in previous research, and the theoretical framework "Immigrant Youth Adaptation in Context" of Motti-Stefanidi et al. (2012). Consequently, this thesis needed to forgo several potential samples from the 10-year age group, due to the unavailability of the selected important predictors. For instance, the education aspiration of children was not available at 10 years age group. Subsequently, this thesis examined the applicability of the framework for this particular group when the children age of 12 years. However, even selecting data from the age of 12 years came with certain limitations, as it required the omission of certain predictors identified in the existing literature. Moreover, using Motti-Stefanidi et al. (2012) framework as a guide to identified influenced variable associated with children outcomes and finding the applicability of this framework to explain individual variability of three outcomes of children of skilled immigrants is a robust strength of this thesis.
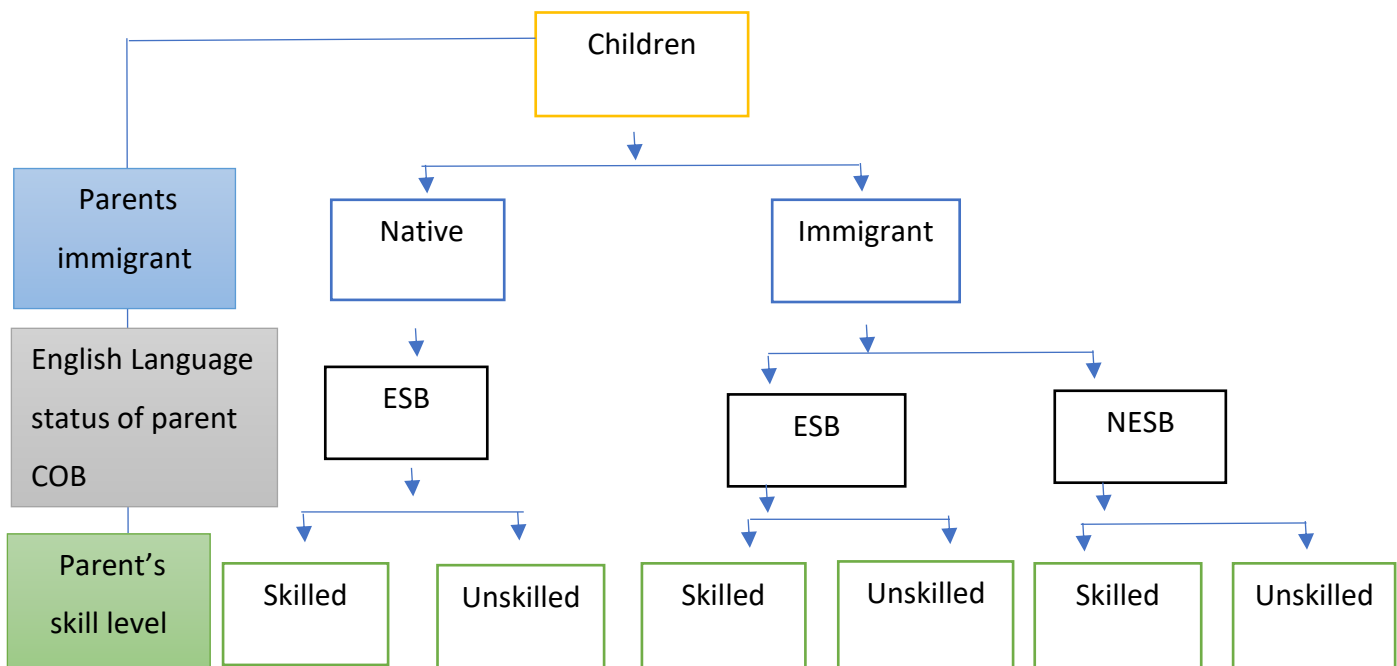
9.4 Future goal

This thesis has focused on children of NESB-skilled immigrants available from the LSAC dataset. In total, there were 19 countries available for children of NESB-skilled immigrants. Given that each country possesses its own unique culture and language, which could impact the result. That is why future research might consider the option of selecting specific single regional group according to their cultural similarities and geographical proximity. The LSAC dataset currently provides data for two specific single regional groups, namely South-Asian and East-Asian groups, which could be chosen to elucidate the adaptation of these distinct regional groups. The insights derived from a specific group could potentially lend support to the findings of this thesis.

Children of NESB-skilled immigrants displayed significantly higher scores in both reading and numeracy performance when compared to children of ESB-skilled immigrants. This was a marked contrast finding from previous findings, which have shown a lower level of outcome for children of immigrants with limited proficiency in the host language (e.g., Toppelberg et al., 2010). As the findings from this thesis have shown variation among two groups of second-generation immigrant children, further research is required to understand the context of children of skilled immigrants from NESB compared to children of skilled immigrants from ESB backgrounds.

Despite certain limitations in terms of participant numbers, the dataset employed in this thesis presents a significant research opportunity to uncover substantial insights. It holds the potential to track the progression of second-generation immigrant children in Australia into young adulthood once the necessary data becomes available. This offers the prospect of gaining a comprehensive understanding of the outcomes for these children over time.

The use of a robust set of archival data provided many benefits, although it also introduced a constraint aligned with research aims. In the beginning, this thesis aimed to explain the immigrants' status effects, language effects, parents' skilled effects, and longitudinal effects. However, the impact of parental skill levels could not be adequately examined due to an insufficient number of participants, as this thesis used the secondary data which was not specifically designed to answer the questions the thesis set out to examine. Therefore, it was consciously decided not to use those groups analysis for the small number of participants. It would be a noteworthy discovery in forthcoming research if relevant data could be obtained which will provide a complete scenario of the adaptation of Australian-born children of immigrants. The following concept diagram (Figure 7.1) will help to explain the skilled effect in the future.

Figure 9-1: Three possible distinct levels of future research

	Children	
	Native	Immigrant

Parents immigrant

English Language status of parent COB

Parent's skill level

- Native → ESB → Skilled / Unskilled
- Immigrant → ESB → Skilled / Unskilled
- Immigrant → NESB → Skilled / Unskilled

9.5 Conclusion

The findings of this thesis are a marked contrast to most reported children of immigrants in the USA and Western Europe. Data originating from Australia reveals that second-generation immigrant children are thriving, with no evidence of poorer outcomes either at age levels or across various outcomes of children of skilled immigrant parents from NESB. Overall, children of NESB immigrants had similar or lower levels of emotional and behavioural problems and they have achieved similar or higher scores in academic achievement in reading and numeracy performance compared to their counterparts: children of ESB skilled immigrants and children of native-born skilled parents. This is consistent with other datasets, such as PISA, regarding the performance of children of immigrants in Australia. It is not clear if this pattern of findings is due to the Australia's distinct context, including its selective migration policy, commitment to multiculturalism, provisions for English language support for non-immigrant children, robust immigrant resettlement programs (new arrivals programs, adult migrant English classes, and migrant

resource centres), other factors (e.g., Asian-American immigrant children showed positive outcomes) or combination of all those factors.

The pattern of immigrant paradox or immigrant disadvantage did not appear in children of NESB skilled immigrants. This might be the cause of the practice of multicultural policy and the maintaining support for immigrant settlement and the English language improvement program in Australia. Children of skilled immigrants from non-English-speaking countries do not share the disadvantageous outcomes observed in previous research conducted in other countries. In Australia, the social policy, the immigration policy and settlement support program, and education have been successful in facilitating equity on psycho-social well-being and academic opportunities and outcomes for most second-generation children of skilled immigrants.

In addition, Motti-Stefanidi et al. (2012) the "Immigrant Youth Adaptation in Context" framework has explained additional independent variance of children on "emotional and behavioural problems", and academic achievement in reading and numeracy performance" of children of NESB skilled immigrants. This was observed specifically in children who have NESB skilled immigrant backgrounds.

Some limitations were noted in the thesis by highlighting the sample size of immigrants children groups and influenced predictors related to outcomes. A lower number of participants among the immigrant children group is a common limitation for the research on the adaptation of this group compared to the non-immigrant children group. Alongside, some important predictors were unable to select because of a minimal variance within-group (parents' academic expectations of their children) and floor and ceiling effects for some measurements. Some of them were insensitive according to culture. These limitations could contribute to their predictors of explanation because changing one single limitation could lead to different findings. Despite these limitations, this thesis exhibited exceptional findings compared to the previous research which could be used as a guideline for future research and policy and practice makers. Several factors concerning immigration policy and

settlement procedures are proposed to contribute to this pattern of findings. This thesis focused specifically on second-generation immigrant children from skilled immigrants, and non-English speaking heritage language country backgrounds, and informed by a well-known framework to explain the applicability in a new group adaptation that is unique in the field.

REFERENCES

Abad, J., Santacana, M. F., & Gomez-Bento, J. (2002). Emotional and behavioral problems as measured by the YSR – Gender and age differences in Spanish adolescents. *European Journal of Psychological Assessment*, *18*(2), 149–157. https://doi.org/10.1027//1015-5759.18.2.157

Achenbach, T. M., Becker, A., Döpfner, M., Heiervang, E., Roessner, V., Steinhausen, H. C., & Rothenberger, A. (2008). Multicultural assessment of child and adolescent psychopathology with ASEBA and SDQ instruments: Research findings, applications, and future directions. *Journal of Child Psychology and Psychiatry, 49*(3), 251-275. https://doi.org/10.1111/j.1469-7610.2007.01867.x

Ahern, K., & Le Brocque, R. (2005). Methodological Issues in the Effects of Attrition: Simple Solutions for Social Scientists. *Field Methods, 17*(1), 53–69. https://doi.org/10.1177/1525822X04271006

Akther, A., & Robinson, J. (2014). Immigrant Students' Academic Performance in Australia, New Zealand, Canada, and Singapore. *Australian Association for Research in Education*. *Web site: http://www.aare.edu.au*

Alarcón, A. A., & Rubio, S. P. (2013). Linguistic integration of the descendants of foreign immigrants in Catalonia. *Migraciones Internacionales, 7*(1), 101-130. https://link.gale.com/apps/doc/A336602870/AONE?u=flinders&sid=bookmark-AONE&xid=1012e910

Alarcón, A., Parella, S., & Yiu, J. (2014). Educational and occupational ambitions among the Spanish 'Second Generation': The case of Barcelona. *Journal of Ethnic and Migration Studies, 40*(10), 1614-1636. https://doi.org/10.1080/1369183X.2013.831550

Alonso-Fernández, N., Jiménez-García, R., Alonso-Fernández, L., Hernández-Barrera, V., & Palacios-Ceña, D. (2017). Mental health and quality of life among Spanish-born and immigrant children in years 2006 and 2012. *Journal of Pediatric Nursing, 36*, 103-110. https://doi.org/10.1016/j.pedn.2017.05.005

Anagnostaki, L., Pavlopoulos, V., Obradović, J., Masten, A., & Motti-Stefanidi, F. (2016). Academic resilience of immigrant youth in Greek schools: Personal and family resources. *European Journal of Developmental Psychology, 13*(3), 377-393. https://doi.org/10.1080/17405629.2016.1168738

Anderson, S., Johnston, W., & Leventhal, T. (2019). When neighborhoods matter: Developmental timing and youth reading achievement and problem behaviors. *Social Science Research*, *81*, 1-11. https://doi.org/10.1016/j.ssresearch.2019.02.010

Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler psychological distress scale (K10). *Australian and New Zealand Journal of Public Health, 25*(6), 494-497. https://doi.org/10.1111/j.1467-842X.2001.tb00310.

Asendorpf, J. B., & Motti-Stefanidi, F. (2017). A longitudinal study of immigrants' peer acceptance and rejection: Immigrant status, immigrant composition of the classroom, and acculturation. *Cultural Diversity and Ethnic Minority Psychology,* *23*(4), 486-498. https://doi.org/10.1037/cdp0000155

Atweh, B., Vale, C., & Walshaw, M. (2012). Equity, diversity, social justice, and ethics in mathematics education. In B. Perry, T. Lowrie, T. Logan, A. MacDonald, & J. Greenlees (Eds.), *Research in mathematics education in Australasia 2008–2011* (pp. 39–65). Sense Publishers.

Aughinbaugh, A., & Gardecki, R. (2007). Attrition in the National Longitudinal Survey of Youth 1997. *Federal Committee on Statistical Methodology, National Center for Education Statistics*. https://nces.ed.gov/FCSM/pdf/2007FCSM

Australian Bureau of Statistics. (2019-20). *Migration, Australia*. ABS.
https://www.abs.gov.au/statistics/people/population/migration-australia/latest-
release.

Australian Bureau of Statistics (2018). Australian demographic statistics, June 2018. ABS cat.
no. 3101.0. Canberra, Australia: ABS.
https://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/E18EA7BE570
1F459CA2583C3000C53C8?opendocument

Australian Bureau of Statistics (2007 -08). Migration, Australia, June 2008. ABS cat.no.
3412.0. Canberra, Australia: ABS.
https://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/3412.0Main%20Featur
es22007-08?opendocument&tabname=Summary&prodno=3412.0&issue=2007-0

Australian Bureau of Statistics (1996). Basic Community Profiles and Bulletin (1996 Census),
Catalogue No. 2017.0, Australian Bureau of Statistics, Canberra.

Australian Institute of Family Studies. (2011). *The longitudinal studies of Australian Studies
Annual report 2010*, Melbourne: AIFS. https://www.aifs.gov.au/corporate/annual-
report-2010-11

Australian Bureau of Statistics LSAC processing team and the Australian Bureau of Statistics
Household Survey Methodology team (2020). *LSAC Technical paper No. 24*, Wave 8
Weighting and Non-Response. Melbourne: Australian Institute of Family Studies.
https://growingupinaustralia.gov.au/sites/default/files/tp24.pdf

Balidemaj, A., & Small, M. (2018). Acculturation, ethnic identity, and psychological well-
being of Albanian-American immigrants in the United States. *International Journal of
Culture and Mental Health, 11*(4), 712-730.
https://doi.org/10.1080/17542863.2018.1556717

Beiser, M., Hou, F., Hyman, I., & Tousignant, M. (2002). Poverty, family process, and the mental health of immigrant children in Canada. *American Journal of Public health*, 92(2). https://doi.org/doi/full/10.2105/AJPH.92.2.220

Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology*, *46*(1), 5-34. https://doi.org/10.1111/j.1464-0597.1997.tb01087.x

Berry, J. W. (2006). Contexts of acculturation. In D.L.Sam & J.W.Berry (Eds), *The Cambrdge Handbook of acculturation psychology* (pp. 97-112). Cambridge, UK: Cambridge University Press. https://doi.org/10.1017/CBO9780511489891.006

Berry, J. W., Poortinga, Y. H., Segall, M. H., & Dasen, P. R. (2002). *Cross-cultural psychology: Research and applications*: Cambridge University Press.

Berry, J.W., & Sam, D.L. (1997). Acculturation and adaptation. In J.W. Berry, M.H. Segall, & C. Kagitcibasi (Eds.), *Handbook of cross-cultural psychology, Vol. 3: Social behaviour and applications* (2nd edn.; pp. 291– 326). Allyn & Bacon.

Berry, J. W., Poortinga, Y. H. Breugelmans, S., Chasiotis, A. & Sam, D. L. (2011). *Cross-cultural psychology: Research and applications* (3rd ed.). Cambridge: Cambridge University Press.

Blakemore, S. J., Burnett, S., & Dahl, R. E. (2010). The role of puberty in the developing adolescent brain. *Human Brain Mapping, 31*(6), 926-933. doi:10.1002/hbm.21052

Bodovski, K., & Durham, R. E. (2010). Parental practices and achievement of Mexican and Chinese immigrant children in the USA: Assimilation patterns? *Research in Comparative and International Education, 5*(2), 156-175. https://doi.org/10.2304/rcie.2010.5.2.156

Bowe, A. G. (2020). The Immigrant paradox among the UK's adolescents: Data from the LSYPE 2004–2010 Project. *Journal of International Migration and Integration, 21*(4), 1205-1224. https://doi.org/ 10.1007/s12134-019-00711-x

Bowe, A. G. (2017). The immigrant paradox on internalizing symptoms among immigrant adolescents. *Journal of Adolescence*, 55, 72-76. https://doi.org/10.1016/j.adolescence.2017.01.002

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. *Handbook of Child Psychology, 1*. https://doi.org/10.1002/9780470147658.chpsy0114

Bryant, J., and Krsinich, F. (2009). Attrition in the Longitudinal Immigration Survey: New Zealand. Presented at the New Zealand Association of Economists Conference 2009. Wellington: Department of Statistics.

Bumgarner, E., Martin, A., & Brooks-Gunn, J. (2013). Approaches to learning and Hispanic children's math scores: The moderating role of English proficiency. *Hispanic Journal of Behavioral Sciences, 35*(2), 241. https://doi.org/10.1177/0739986312473580

Burkam, D., and V. Lee. 2000. Effects of monotone and nonmonotone attrition on parameter estimates in regression models with educational data. *The Journal of Human Resources* 33(2): 555–72.

Bayram Özdemir, S., Stattin, H. (2014). Why and When is Ethnic Harassment a Risk for Immigrant Adolescents' School Adjustment? Understanding the Processes and Conditions. *Journal of Youth and Adolescence* 43, 1252–1265. https://doi.org/10.1007/s10964-013-0038-y

Casey, T. & Dustmann, C. (2008). Intergenerational transmission of language capital and economic outcomes. *Journal of Human Resources, 43*(3), 660-687. https://doi.org/10.3368/jhr.43.3.660

Castles, S. (2000). International migration at the beginning of the twenty-first century: global trends and issues. *International Social Science Journal, 52*(165), 269-281. https://doi.org/10.1111/1468-2451.00258

Castles, S., Miller, M. J., & Ammendola, G. (2005). The age of migration: International population movements in the modern world. *American Foreign Policy Interests, 27*(6), 537-542. https://doi.org/10.1080/10803920500434037

Central Intelligence Agency. (2014). *Country data codes*. The-world-factbook. Central Intelligence Agency.gov. https://www.cia.gov/library/publications/the-world-factbook/fields/print_2098.html

Cervantes, R. C., Padilla, A. M., Napper, L. E., & Goldbach, J. T. (2013). Acculturation-related stress and mental health outcomes among three generations of Hispanic adolescents. *Hispanic Journal of Behavioral Sciences, 35*(4), 451-468. https://doi.org/10.1177%2F0739986313500924

Chen, S. H., Main, A., Zhou, Q., Bunge, S. A., Lau, N., & Chu, K. (2015). Effortful control and early academic achievement of Chinese American children in immigrant families. *Early Childhood Research Quarterly, 30*(Part A), 45-56. https://doi.org/10.1016/j.ecresq.2014.08.004

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). 98:259-261. John Wiley & Sons

Cobb-Clark, A. D., Sinning, M., & Stillman, S. (2012). Migrant youths' educational achievement: The role of institutions. *The ANNALS of the American Academy of Political and Social Science, 643 (1).* https://doi-org/10.1177/0002716212440786.

Coll, C. G., & Marks, A. K. (Eds.). (2012). *The immigrant paradox in children and adolescents: Is becoming American a developmental risk?* American Psychological Association.

Connelly, R., & Platt, L. (2014). Cohort profile: UK Millennium Cohort Study (MCS). *International Journal of Epidemiology*, 1719–1725. https://doi.org/ 10.1093/ije/dyu001

Correa-Velez, I., Gifford, S. M., & Barnett, A. G. (2010). Longing to belong: Social inclusion and wellbeing among youth with refugee backgrounds in the first three years in Melbourne, Australia. *Social Science & Medicine, 71*(8), 1399-1408. https://doi.org/ 10.1016/j.socscimed.2010.07.018

Crosnoe, R., & Turley, R. N. L. (2011). K-12 educational outcomes of immigrant youth. *Future of Children*, *21*(1), 129-152. https://doi.org/ 10.1353/foc.2011.0008

Curtis, L. J., Dooley, M. D., & Phipps, S. A. (2003). Child well-being and neighbourhood quality: Evidence from the Canadian National Longitudinal Survey of Children and Youth. *Social Science and Medicine*, *58* (2004), 1917 – 1927. https://doi.org/10.1016/j.socscimed.2003.08.007

Daga, S. S., Raval, V. V., & Raj, S. P. (2015). Maternal meta-emotion and child socioemotional functioning in immigrant Indian and White American families. *Asian American Journal of Psychology, 6*(3), 233. https://doi.org/10.1037/aap0000014

Davey, A., Shanahan, M., & Schafer, J. (2001). Correcting for selective nonresponse in the national longitudinal survey of youth using multiple imputation. *The Journal of Human Resources* 36 (3): 500–19

Dekeyser, L., Svedin, G. C., Agnafors, S., & Sydsjo, G. (2011). Self-reported mental health in 12-year-old second-generation immigrant children in Sweden. *Nordic Journal of Psychiatry*, *65* (6), 389-395. https://doi.org/10.3109/08039488.2011.566936

Duinhof, E. L, Smid, S. C., Vollebergh, W A.M., & Stevens, G.W.J.M. (2020). Immigration background and adolescent mental health problems: The role of family affluence,

adolescent educational level, and gender. *Social Psychiatry and Psychiatric Epidemiology*, 55 (4), 435-445. https://doi.org/10.1007/s00127-019-01821-8

Dustmann, C., Frattini, T., & Lanzara, G. (2012). Educational achievement of second-generation immigrants: an international comparison*. *Economic Policy, 27*(69), 143-185. https://doi.org/10.1111/j.1468-0327.2011. 00275.x

Eitle, T. M., Wahl, A.-M. G., & Aranda, E. (2009). Immigrant generation, selective acculturation, and alcohol use among Latina/o adolescents. *Social Science Research, 38*(3), 732-742. https://doi.org/10.1016/j.ssresearch.2009.01.006

Entorf, H., & Minoiu, N. (2005). What a difference immigration policy makes: A comparison of PISA scores in Europe and traditional countries of immigration. *German Economic Review, 6*(3), 355-376. https://doi.org/10.1111/j.1468-0475.2005.00137.x

Fandrem, H., Strohmeier, D., & Roland, E. (2009). Bullying and victimization among native and immigrant adolescents in Norway: The role of proactive and reactive aggressiveness. *The Journal of Early Adolescence, 29*(6), 898-923. https://doi.org/10.1177/0272431609332935

Friberg, J. H. (2019). Does selective acculturation work? Cultural orientations, educational aspirations, and school effort among children of immigrants in Norway. *Journal of Ethnic and Migration Studies, 45*(15), 2844-2863. https://doi.org/10. 1080/1369183X.2019.1602471

Fuligni, A. J. (1997). The academic achievement of adolescents from immigrant families: The role of family background, attitudes, and behavior. *Child Development, 68*(2), 351-363. https://doi.org/10.1111/j.1467-8624. 1997.tb01944.x

Fuligni, A. J. (1998). The adjustment of children from immigrant families. *Current Directions in Psychological Science, 7*(4), 99-103. https://doi.org/10.1111/1467-8721.ep10774731.

Garcia-Coll, C., Lamberty, G., Jenkins, R., McAdoo, H. P., Crnic, K., Wasik, B. H., et al. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development*, 67, 1891-1914. https://doi.org/10.1111/j.1467-8624.1996.tb01834.x

Garmezy, N., Masten, A. S., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development*, *55* (1), 97-111. https://doi.org/10.2307/1129837

Gillborn, D. (1997). Ethnicity and educational performance in the United Kingdom: Racism, ethnicity, and variability in achievement. *Anthropology & Education Quarterly*, *28*(3), 375-393. https://doi.org/10.1525/aeq.1997.28.3.375

Goforth, A. N., Pham, A. V., Chun, H., Castro-Olivo, S. M., & Yosai, E. R. (2016). Association of acculturative stress, islamic practices, and internalizing symptoms among Arab American adolescents. *School Psychology Quarterly, 31*(2), 198-212. https://doi.org/10.1037/spq0000135

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*(5), 581-586. https://doi.org/10.1111/j.1469-7610. 1997.tb01545.x

Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(11), 1337-1345. https://doi.org/10.1097/00004583-200111000-00015

Goodman, R., & Scott, S. (2012). *Child and adolescent psychiatry*. Wiley-Blackwell.

Gorodzeisky, A., Sarid, O., Mirsky, J., & Slonim-Nevo, V. (2014). Immigrant families: Mothers' and fathers' proficiency in a host-country language and psychological well-being of daughters and sons. *Journal of Cross-Cultural Psychology, 45*(5), 713-727. https://doi.org/10.1177%2F0022022113519859

Gowan, S. (2023). Exclusion After Inclusion: A Bitter Reality. In *The Ethnically Diverse Workplace: Experience of Immigrant Indian Professionals in Australia* (pp. 47-68). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80382-053-820221003

Growing up in Australia. (2018). *The longitudinal study of Australian children: An Australian government initiative.* Data user guide. Australian Institute of Family Studies, in partnership with Australian Bureau of Statistics and Department of Social Services https://growingupinaustralia.gov.au/sites/default/files/publication-documents/lsac_data_user_guide_2018-final-v4.pdf

Guerra, R., Rodrigues, R. B., Aguiar, C., Carmona, M., Alexandre, J., & Lopes, R. C. (2019). School achievement and well-being of immigrant children: The role of acculturation orientations and perceived discrimination. *Journal of School Psychology, 75*, 104-118. https://doi.org/10.1016/j.jsp.2019.07.004

Haller, W., Portes, A., & Lynch, S. M. (2011). Dreams fulfilled; dreams shattered: Determinants of segmented assimilation in the second generation. *Social Forces, 89*(3), 733-762, https://doi.org/ 10.1353/sof.2011.0003

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*(2), 625-638. https://doi.org/10.1111/1467-8624.00301

Hao, L., & Bonstead-Bruns, M. (1998). Parent-child differences in educational expectations and the academic achievement of immigrant and native students. *Sociology of Education*, 71(3)175-198. https://doi.org/10.2307/2673201

Hawes, D. J., & Dadds, M. R. (2004). Australian data and psychometric properties of the Strengths and Difficulties Questionnaire. *Australian and New Zealand Journal of Psychiatry, 38*(8), 644-651. https://doi.org/10.1111/j.1440-1614.2004. 01427.x

Heintz-Martin, V. K., & Langmeyer, A. N. (2020). Economic situation, financial strain and child wellbeing in stepfamilies and single-parent families in Germany. *Journal of Family and Economic Issues*, *41*(2), 238-254. https://doi.org/10.1007/s10834-019-09653-z

Hickman, M., Crowley, H., & Mai, N. (2008). *Immigration and social cohesion in the UK. Joseph Rowntree Foundation*.

Hirano, K., Imbens, G. W., Ridder, G., & Rubin, D. B. (2001). Combining panel data sets with attrition and refreshment samples. *Econometrica* 69:1645–59

Hjern, A., Rajmil, L., Bergström, M., Berlin, M., Gustafsson, P. A., & Modin, B. (2013). Migrant density and well-being—A national school survey of 15-year-olds in Sweden. *The European Journal of Public Health, 23*(5), 823-828. https://doi.org/10.1093

Hobfoll, S. E. (2002). Social and psychological resources and adaptation. *Review of General Psychology, 6*(4), 307-324. https://doi.org/10.1037%2F1089-2680.6.4.307

Huggins, J., & Dimopoulos, M. (2023). In conversation with Dr Jackie Huggins [Journal Article]. *Journal of Australian Indigenous Issues*, *26*(1–2), 53-55. https://search.informit.org/doi/10.3316/informit.235472137007315

Hyde, J., Lindberg, S., Linn, M., Ellis, A., Williams, C. (2008). Gender similarities characterize math performance. *Science*, *321*, 494–495. https://www.jstor.org/stable/20054571

IBM Corp. Released (2017). *IBM SPSS Statistics for Windows*, (Version 25.0.0.1) IBM Corp.

Islam, A., Sarkar, D., & Smyth, R. (2022). How do children of immigrants perform? Evidence from Australian nationwide standardized tests. *International Migration. 60(4), 93-136.* https://doi.org/10.1111/imig.12914

Jasinskaja-Lahti, I., & Liebkind, K. (2007). A structural model of acculturation and well-being among immigrants from the former USSR in Finland. European Psychologist, 12(2), 80-92. https://doi.org/10.1027/1016-9040.12.2.80

Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S.-L., . . . Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*(6), 959-976. https://doi.org/10.1017/S0033291702006074

Kim, Y., Evans, B. E., & Hagquist, C. (2020). Mental health problems among adolescents in Sweden from 1995 to 2011: The role of immigrant status and the proportions of immigrant adolescents in their surrounding community. *Journal of Immigrant and Minority Health*, *22*(2), 232–239. https://doi.org/10.1007/s10903-019-00951-0

Koustourakis, G. S., Asimaki, A., & Spiliopoulou, G. (2016). Cultural capital and educational expectations of native and immigrant parents of primary school students: a qualitative study. *International Journal of Sociology of Education, 5*(3), 166-189. https://doi.org/10.17583/rise.2016.1892

Kroneberg, C. (2008). Ethnic communities and school performance among the new second generation in the United States: Testing the Theory of Segmented Assimilation. *Annals of the American Academy of Political and Social Science, 620 (1)*, 138-160. https://doi.org/10.1177/0002716208322714

Lara-Cinisomo, S., Xue, Y., & Brooks-Gunn, J. (2013). Latino youth's internalising behaviours: links to immigrant status and neighbourhood characteristics. *Ethnicity & health, 18*(3), 315-335. https://doi.org/10.1080/13557858.2012.734278

Legewie, J., & DiPrete, T. A. (2012). School context and the gender gap in educational achievement. *American Sociological Review, 77* (3), 463–485. https://doi.org/10.1016/j.econedurev.2017.03.001

Levels, M., & Dronkers, J. (2008). Educational performance of native and immigrant children from various countries of origin. *Ethnic and Racial Studies, 31*(8), 1404-1425. https://doi.org/10.1080/01419870701682238

Levels, M., Dronkers, J., & Kraaykamp, G. (2008). Immigrant children's educational achievement in western countries: origin, destination, and community effects on mathematical performance. *American Sociological Review, 73*(5), 835-853. https://doi.org/10.1177%2F000312240807300507

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*, *126*(2), 309–337. https://doi.org/10.1037//0033-2909.126.2.309.

Lew, S., & Harklau, L. (2018). Too much of a good thing? Self-esteem and Latinx immigrant youth academic achievement. *Journal of Advanced Academics*, 29(3), 171-194. https://doi.org/10.1177/1932202X18760280

Li, Y. (2014). Intergenerational conflict, attitudinal familism, and depressive symptoms among Asian and Hispanic adolescents in immigrant families: A latent variable interaction analysis. *Journal of Social Service Research, 40*(1), 80-96. https://doi.org/10.1080/01488376.2013.845128

Liu, A., & Xie, Y. (2016). Why do Asian Americans academically outperform Whites? The cultural explanation revisited. *Social Science Research, 58*, 210-226.

Longitudinal Study of Australian Children. (2014). The educational expectations of Australian children and their mothers. *LSAC Annual Statistical Report 2014*. 105-129. http://www.growingupinaustralia.gov.au/pubs/asr/2014/asr2014.pdf

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*(3), 543-562. https://doi.org/10.1111/1467-8624.00164

Ly, J., Zhou, Q., Chu, K., & Chen, H.S. (2012). Teacher–child relationship quality and academic achievement of Chinese American children in immigrant families. *Journal of School Psychology*, *50* (4), 535 – 553. https://doi.org/10.1016/j.jsp.2012.03.003

Magnusson, D., & Cairns, R. B. (1996). Developmental science: Toward a unified framework. In R. B. Cairns, G. H. Elder, Jr., & E. J. Costello (Eds.), *Developmental science* (pp. 7–30). Cambridge University Press. https://doi.org/10.1017/CBO9780511571114.003

Magnusson, D., & Stattin, H. (2006). The person in context: A holistic-interactionistic approach. In R. M. Lerner & W. Damon (Eds.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (6th ed., pp. 400–464). Wiley & Sons Inc. https://doi.org/10.1002/9780470147658.chpsy0108.

Marks, G. N. (2007). Accounting for the gender gaps in student performance in reading and mathematics: Evidence from 31 countries. *Oxford Review of Education*, *34(1)*, 89–109. https://doi.org/10.1080/03054980701565279

Marks, A. K., Ejesi, K., & García Coll, C. (2014). Understanding the US immigrant paradox in childhood and adolescence. *Child Development Perspectives, 8*(2), 59-64. https://doi.org/10.1111/cdep.12071

Marks, A. K., McKenna, J. L., & Coll, C. G. (2018). National Immigration Receiving Contexts. *European Psychologist, 23*(1), 6-20. https://doi.org/10.1027/1016-9040/a000311

Marks, A. K., McKenna, M. C., & Coll, C. G. (2018). Positive integration: A culturally relevant approach to reducing disparities in mental health outcomes among diverse ethnic/racial minority populations. *American Psychologist*, 73(6), 741-754. https://doi.org/10.1037/amp0000320.

Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., . . . Tellegen, A. (2005). Developmental cascades: linking academic achievement and externalizing

and internalizing symptoms over 20 years. *Developmental Psychology, 41*(5), 733. https://doi.org/10.1037/0012-1649.41.5.733

Masten, A. S.(2006). Developmental psychopathology: Pathways to the future. International Journal of Behavioral Development, 30 (1), 47-54. https://doi.org/10.1177/0165025406059974

Masten, A. S. (2007). Resilience in developing systems: Progress and promise as the fourth wave rises. *Development and Psychopathology, 19*(3), 921-930. https://doi.org/10.1017/S0954579407000442

Masten, A. S. (2014). Global perspectives on resilience in children and youth. *Child Development, 85*(1), 6-20. https://doi.org/10.1111/cdev.12205

McCormick, C. M., Kuo, S. I.-C., & Masten, A. S. (2011). Developmental tasks across the life span. In K. L. Fingerman, C. A. Berg, J. Smith & T. C. Antonucci (Eds.), *Handbook of life-span development* (pp. 117–139). Springer.

Miller, P. A., & Eisenberg, N. (1988). The relation of empathy to aggressive and externalizing/antisocial behavior. *Psychological Bulletin, 103*(3), 324. https://doi.org/10.1037/0033-2909.103.3.324

Mohal, J., Lansangan, C., Gasser, C., Taylor, T., Renda, J., Jessup, K., & Daraganova, G. (2021). Growing Up in Australia: *The Longitudinal Study of Australian Children – Data User Guide, Release 9C1, June 2021*. Melbourne: Australian Institute of Family Studies. https://doi.org/10.26193/BAA3N6

Moilanen, I., & Rantakallio, P. (1988). The single parent family and the child's mental health. *Social Science Medicine*. 27(2), 181-186. https://doi.org/10.1016/0277-9536(88)90327-9

Mok, S. Y., Martiny, S. E., Gleibs, I. H., Keller, M. M., & Froehlich, L. (2016). The relationship between ethnic classroom composition and Turkish-origin and German students' reading performance and sense of belonging. *Frontiers in Psychology*, *7*(1071), https://doi.org/10.3389/fpsyg.2016.01071.

Motti-Stefanidi, F. (2014). Immigrant youth adaptation in the Greek school context: A risk and resilience developmental perspective. *Child Development Perspectives, 8*(3), 180-185. https://doi.org/10.1111/cdep.12081

Motti-Stefanidi, F. (2015). Risks and resilience in immigrant youth adaptation: Who succeeds in the Greek school context and why? *European Journal of Developmental Psychology, 12*(3), 261-274. https://doi.org/10.1080/17405629.2015.1020787

Motti-Stefanidi, F., Pavlopoulos, V., Spyros, T. (2011). Parent-adolescent conflict and adolescents' adaptation: A longitudinal study of Albanian immigrant youth living in Greece. *International Journal of Developmental Science*, *5*(1-2), 57-71. https://doi.org/10.3233/DEV-2011-11074

Motti-Stefanidi, F., Pavlopoulos, V., Obradović, J., Dalla, M., Takis, N., Papathanassiou, A., & Masten, A. S. (2008). Immigration as a risk factor for adolescent adaptation in Greek urban schools. *European Journal of Developmental Psychology, 5*(2), 235-261. https://doi.org/10.1080/17405620701556417

Motti-Stefanidi, F., Pavlopoulos, V., Mastrotheodoros, S., & Asendorpf, J. B. (2020). Longitudinal interplay between peer likeability and youth's adaptation and psychological well-being: A study of immigrant and nonimmigrant adolescents in the school context. *International Journal of Behavioral Development*, 0165025419894721. https://doi.org/10.1177%2F0165025419894721

Motti-Stefanidi, F., Asendorpf, J. B., & Masten, A. S. (2012). The adaptation and well-being of adolescent immigrants in Greek schools: A multilevel, longitudinal study of risks

and resources. *Development and Psychopathology, 24*(2), 451-473. https://doi.org/10.1017/S0954579412000090

Motti-Stefanidi, F., Berry, J., Chryssochoou, X., Sam, D. L., & Phinney, J. (2012). Positive immigrant youth adaptation in context: Developmental, acculturation, and social-psychological perspectives. In A. S. Masten, K. Liebkind, & D. J. Hernandez (Eds.), *Realizing the potential of immigrant youth* (pp. 117–158). Cambridge University Press. https://doi.org/10.1017/CBO9781139094696.008

Motti-Stefanidi, F., & Asendorpf, J. B. (2012). Perceived discrimination of immigrant adolescents in Greece. *European Psychologist*, 17(2), 93-104. https://doi.org/10.1027/1016-9040/a000116

Motti-Stefanidi, F., & Masten, A. S. (2013). School success and school engagement of immigrant children and adolescents. *European Psychologist*, 18(2), 126-135. https://doi.org/10.1027/1016-9040/a000139

Motti-Stefanidi, F., Masten, A., & Asendorpf, J. B. (2015). School engagement trajectories of immigrant youth: Risks and longitudinal interplay with academic success. *International Journal of Behavioral Development, 39*(1), 32-42. https://doi.org/10.1177%2F0165025414533428

Morrison, F. J., & Ornstein, P. A. (1996). Cognitive development. In R. B. Cairns, G. R. Elder, & E. J. Costello (Eds.), *Developmental S*cience (pp. 121-134). Cambridge University Press

Musso, P., Inguglia, C., & Coco, A. L. (2015). Acculturation profiles and perceived discrimination: Associations with psychosocial well-being among Tunisian adolescents in Italy. *Social Inquiry into Well-being, 1*(1), 76-90. https://doi.org/10.13165/SIIW-15-1-1-06

Nakash, O., Nagar, M., Shoshani, A., Zubida, H., & Harper, R. A. (2012). The effect of acculturation and discrimination on mental health symptoms and risk behaviors among adolescent migrants in Israel. *Cultural Diversity and Ethnic Minority Psychology, 18*(3), 228. https://doi.org/10.1037/a0027659

National Assessment Program (2018). Australian Curriculum, Assessment and Reporting Authority 2018, NAPLAN Achievement in Reading, Writing, Language Conventions and Numeracy: National Report for 2018, ACARA, Sydney. https://www.nap.edu.au/results-and-reports/how-to-interpret

National Assessment Program (2019). Australian Curriculum, Assessment and Reporting Authority 2018, National Assessment Program – Literacy and Numeracy 2018: Technical Report, ACARA, Sydney. https://www.nap.edu.au/docs/default-source/default-document-library/2018_naplan_technical_report_full_v1.pdf

Neto, F. (2006). Psycho-social predictors of perceived discrimination among adolescents of immigrant background: A Portuguese study. *Journal of Ethnic and Migration Studies, 32*(1), 89-109. https://doi.org/10.1080/13691830500335507

Neto, F. (2010). Predictors of adaptation among adolescents from immigrant families in Portugal. *Journal of Comparative Family Studies, 41*(3), 437-454. https://doi.org/10.3138/jcfs.41.3.437

Nigg, J. T., Quamma, J. P., Greenberg, M. T., & Kusche, C. A. (1999). A two-year longitudinal study of neuropsychological and cognitive performance in relation to behavioral problems and competencies in elementary school children. *Journal of Abnormal Child Psychology* 27(1): 51–57.

Noam, G., Oppedal, B., Idsoe, T., & Panjwani, N. (2014). Mental health problems and school outcomes among immigrant and non-immigrant early adolescents in Norway. *School Mental Health, 6*(4), 279-293. https://doi.org/ 10.1007/s12310-014-9129-5

Oppedal, B. (2006). Development and acculturation. In D. L. Sam & J. W. Berry (Eds.), *The Cambridge Handbook of acculturation psychology* (pp, 97-112). Cambridge, UK: Cambridge University Press.

Oppedal, B. (2017). Mental health among immigrant background youth in Norway. In F. Travato (Ed.), *Migration, health, and survival: International perspective* (pp. 67– 87). Edward Elgar Publishing.

Oppedal, B., & Røysamb, E. (2004). Mental health, life stress and social support among young Norwegian adolescents with immigrant and host national background. *Scandinavian Journal of Psychology, 45*(2), 131-144. https://doi.org/10.1111/j.1467-9450.2004.00388.x

Organisation for Economic Co-operation and Development. (2006). *Where immigrant students succeed: A comparative review of performance and engagement in PISA 2003*. Pisa 2003. OECD Publishing.

Organisation for Economic Co-operation and Development. (2012). *Untapped skills. Realising the potential of immigrant students*. OECD Publishing.

Organization for Economic Co-operation and Development (2013). PISA 2012 assessment and analytical framework: Mathematics, reading, science, problem solving and financial literacy. OECD Publishing. https://doi.org/10.1787/9789264190511-en

Organisation for Economic Co-operation and Development. (2015). *The ABC of gender equality in education: aptitude, behavior, confidence.* OECD Publishing.

Organisation for Economic Co-operation and Development. (2016). *PISA 2015 results (Volume I): Excellence and Equity in Education.* OECD Publishing.

Papadopoulos, P., & Viegas, K. (2017). Migration: Shifting goalposts in Australia's skilled

    migration program. *LSJ: Law Society of NSW Journal 36*, 75-77. https://doi.org/

    10.3316/informit.033327143616382

Petterson, S. M., & Albers, A. B. (2001). Effects of poverty and maternal depression on early

    child development. *Child Development, 72*(6), 1794-1813.

    https://doi.org/10.1111/1467-8624.00379

Phinney, J. S., & Baldelomar, O. A. (2011). Identity development in multiple cultural

    contexts. In L. A. Jensen (Ed.), *Bridging cultural and developmental psychology: New*

    syntheses for theory, research, and policy (pp. 161– 186). Oxford University Press.

Reardon, F. R., & Galindo, C. (2009). The Hispanic-White Achievement Gap in Math and

    Reading in the Elementary Grades. *American Educational Research Journal, 46 (3).*

    https://doi.org/10.3102/0002831209333184

Reitz, A. K., Motti-Stefanidi, F., & Asendorpf, J. B. (2014). Mastering developmental

    transitions in immigrant adolescents: The longitudinal interplay of family functioning,

    developmental and acculturative tasks. *Developmental Psychology, 50*(3), 754.

    https://doi.org/10.1037/a0033889

Robinson, J., & Akther, A. (2014). *Good move? Factors influencing the academic attainment*

    of young people from immigrant backgrounds in 17 countries. Invited symposium,

    23rd Biennial Meeting of the International Society for the Study of Behavioural

    Development (ISSBD), Shanghai, China, July 2014

Rogers-Sirin, L., & Gupta, T. (2012). Cultural identity and mental health: Differing trajectories

    among Asian and Latino youth. *Journal of Counseling Psychology, 59*(4), 555-566.

    https://doi.org/10.1037/a0029329

Roorda, D. L., & Koomen, H. M. (2020). Student–teacher relationships and students' externalizing and internalizing behaviors: A Cross-Lagged Study in secondary education. *Child Development*. 92(1), 174-188. https://doi.org/10.1111/cdev.13394

Rosenbaum, E., & Rochford, J. A. (2008). Predictors of academic performance: Generational patterns in academic performance: The variable effects of attitudes and social capital. *Social Science Research, 37*(1), 350-372.   https://doi.org/ 10.1016/j.ssresearch.2007.03.003

Rosenbaum, E., & Rochford, J. A. (2008). Generational patterns in academic performance: The variable effects of attitudes and social capital. *Social Science Research, 37*(1), 350-372. https://doi.org/10.1016/j.ssresearch.2007.03.003

Rothman, S. (2009). Estimating Attrition Bias in the Year 9 Cohorts of the Longitudinal Surveys of Australian Youth: *Technical Report No. 48.* Melbourne: Australian Council for Educational Research. https://research.acer.edu.au/lsay_technical/48

Roy, B.V., Groholt, B., Heyerdahl, S., & Clench-Aas, J. (2010). Understanding discrepancies in parent-child reporting of emotional and behavioural problems: Effects of relational and socio-demographic factors. *BMC Psychiatry*. 10(1), 1-12. https://doi.org/ 10.1186/1471-244X-10-56

Roy, A.L., & Raver, C.C. (2014). Are all risks equal? Early experiences of poverty-related risk and children's functioning. *Journal of Family Psychology*. 28(3). 391-400. https://doi.org/10.1037/A0036683

Rubin, D. B. (1976). Inference and missing data. *Biometrika* 63 (3): 581–92. https://doi.org/10.1093/biomet/63.3.581

Rudasill, K. M., & Rimm-Kaufman, S. E. (2009). Teacher–child relationship quality: The roles of child temperament and teacher–child interactions. *Early Childhood Research Quarterly, 24*(2), 107-120. https://doi.org/10.1016/j.ecresq.2008.12.003

Runge, R. A., & Soellner, R. (2019). Measuring children's emotional and behavioural problems: are SDQ parent reports from native and immigrant parents comparable? *Child and adolescent psychiatry and mental health, 13*(1), 1-15. https://doi.org/10.1186/s13034-019-0306-z

Rutter, M. (1985). Resilience in the face of adversity. Protective factors and resistance to psychiatric disorder. The British Journal of Psychiatry, *147*(6), 598-611. https://doi.org/10.1192/bjp.147.6.598

Sam, D. L. (2017). Multiculturalism. In F. M. Moghaddam (Ed.). *The SAGE encyclopedia of political behavior* (pp. 503-507). Thousand Oaks, California: Publishing Company: SAGE Publications, Inc. https://doi.org/10.1016/j.adolescence.2017.08.007

Sakellariou, C. (2018) Selective immigration policies as screening devices and the immigrant–native educational achievement gap, *Educational Research and Evaluation, 24*(6-7), 394-416, https://doi.org/10.1080/13803611.2018.1549998

Salas-Wright, P. C., Kagotho, N., Vaughn, G. M. (2014). Mood, anxiety, and personality disorders among first and second-generation immigrants to the United States. Psychiatry Research, *220*(3), 1023 -1036. https://doi.org/10.1016/j.psychres.2014.08.045

Sam, D. L. (2006). Adaptation of children and adolescents with immigrant background: Acculturation or development. In M. Bornstein & L. R. Cote (Eds.), *Acculturation and parent-child relationships: Measurement and development* (pp. 97-112). Mahwah, NJ: Lawrence Erlbaum Associates.

Sam, D. L., Vedder, P., Liebkind, K., Neto, F., & Virta, E. (2008). Immigration, acculturation, and the paradox of adaptation in Europe. *European Journal of Developmental Psychology, 5*(2), 138-158. https://doi.org/10.1080/17405620701563348

Santiago, C. D., Ros, A. M., Distel, L. M., Papadakis, J. L., Torres, S. A., Brewer, S. K., Fuller, A. K., & Bustos, Y. (2020). Family coping among Mexican-origin immigrants: Links to child mental health. Journal of Child and Family Studies, 29(1), 182–194. https://doi.org/10.1007/s10826-019-01602-6

Schachner, M. K., He, J., Heizmann, B., & Van de Vijver, F. J. (2017). Acculturation and school adjustment of immigrant youth in six European countries: Findings from the Programme for International Student Assessment (PISA). *Frontiers in Psychology, 8*, 649. https://doi.org/10.3389/fpsyg.2017.00649

Schmepf, S.V. (2007). Immigrants' educational disadvantage: An examination across ten countries and three surveys. *Journal of Population Economics 20,* 527-545. https://doi.org/10.1007/s00148-006-0102

Schnell, P., & Azzolini, D. (2015). The academic achievements of immigrant youths in new destination countries: Evidence from southern Europe. *Migration Studies, 3*(2), 217-240. https://doi.org/10.1093/migration/mnu040

Schuller, S. (2015). Parental ethnic identity and educational attainment of second-generation immigrants. *Journal of Population Economics, 28(4),* 965-1004. https://doi.org/ 10.1007/s00148-015-0559-7

Seltzer, J. A. (1994). Consequences of marital dissolution for children*. Annual Review of Sociology*, *20*, 235–266. https://doi.org/10.1146/annurev.so.20.080194.001315

Silveira, F., Dufur, M. J., Jarvis, J. A., & Rowley, K. J. (2019). The influence of foreign-born population on immigrant and native-born students' academic achievement. *Socius, 5*(Jan-Dec). https://doi.org/10.1177/2378023119845252

Sinclair, S., Hardin, C. D. & Lowery, B. S. (2006). Implicit self-stereotyping in the context of multiple social identities. *Journal of Personality and Social Psychology*, *90*(4), 529–542. https://doi.org/ 10.1037/0022-3514.90.4.529

Sirin, S. R., Gupta, T., Ryce, P., Katsiaficas, D., Suarez-Orozco, C., & Rogers-Sirin, L. (2013). Understanding the role of social support in trajectories of mental health symptoms for immigrant adolescents. *Journal of Applied Developmental Psychology, 34*(5), 199-207. https://doi.org/10.1016/j.appdev.2013.04.004

Sirin, S. R., Ryce, P., Gupta, T., & Rogers-Sirin, L. (2013). The role of acculturative stress on mental health symptoms for immigrant adolescents: a longitudinal investigation. *Developmental Psychology, 49*(4), 736-748. https://doi.org/10.1037/a0028398

Sirin, S. R., Sin, E., Clingain, C., & Rogers-Sirin, L. (2019). Acculturative stress and mental health: Implications for immigrant-origin youth. *Pediatric Clinics, 66*(3), 641-653. https://doi.org/10.1016/j.pcl.2019.02.010

Snow, C. E. (2016). Language and literacy development of dual language learners in the United States. *Child Development Perspectives*, *10*(4), 202-207. https://doi.org/10.1111/cdep.12194.

Solberg, V. S. H., Carlstrom, A. H., Howard, K. A. S., & Jones, J. E. (2007). Classifying at risk high school youth: The influence of exposure to community violence and protective factors on academic and health outcomes. *Career Development Quarterly*, 55, 313-327. http://doi.org/10.1002/j.2161-0045.2007.tb00086.x

Stefanek, E., Strohmeier, D., Fandrem, H., & Spiel, C. (2012). Depressive symptoms in native and immigrant adolescents: the role of critical life events and daily hassles. *Anxiety, Stress & Coping, 25*(2), 201-217. https://doi.org/10.1080/10615806.2011.605879

Steinhausen, H.-c., Bearth-carrari, C., & Winkler Metzke, C. (2009). Psychosocial adaptation of adolescent migrants in a Swiss community survey. *Social Psychiatry and Psychiatric Epidemiology, 44*(4), 308-316. https://doi.org/10.1007/s00127-008-0437-7

Stevens, G. W., Walsh, S. D., Huijts, T., Maes, M., Madsen, K. R., Cavallo, F., & Molcho, M. (2015). An internationally comparative study of immigration and adolescent emotional and behavioral problems: Effects of generation and gender. *Journal of Adolescent Health, 57*(6), 587-594. https://doi.org/10.1016/j.jadohealth.2015.07.001

Strohmeier, D., Kärnä, A., & Salmivalli, C. (2011). Intrapersonal and interpersonal risk factors for peer victimization in immigrant youth in Finland. *Developmental Psychology, 47*(1), 248. https://doi.org/10.1037/a0020785

Suárez-Orozco, C., & Suárez-Orozco, M.M. (2009). *Children of immigration*. Harvard University Press.

Suarez-Orozco, C., Rhodes, J., & Milburn, M. (2009). Unraveling the immigrant paradox: Academic engagement and disengagement among recently arrived immigrant youth. *Youth & Society, 41*(2), 151-185. https://doi.org/10.1177%2F0044118X09333647

Suárez-Orozco, C., Gaytán, F. X., Bang, H. J., Pakes, J., O'Connor, E., & Rhodes, J. (2010). Academic trajectories of newcomer immigrant youth. *Developmental Psychology, 46*(3), 602. https://doi.org/10.1037/a0018201

Sweetman, A., & J. C. van Ours (2015). Immigration: What about the children and grandchildren? In B. R. Chiswick and P. W. Miller (Eds.), *Handbook of the economics of immigration*, (1141 – 1193). Elsevier.

Teja, Z., & Schonert-Reichl, K. A. (2013). Peer relations of Chinese adolescent newcomers: Relations of peer group integration and friendship quality to psychological and school adjustment. *Journal of International Migration and Integration, 14*(3), 535-556. https://doi.org/ 10.1007/s12134-012-0253-5

Thalheimer, W., & Cook, S. (2002, August). *How to calculate effect sizes from published research articles: A simplified Methodology.* Retrieved June 29, 2021, from http://work-learning.com/effect_sizes.htm.

Thomas, K.J.A. (2009). Parental characteristics and the schooling progress of the children of immigrant and U.S.-born blacks. *Demography, 46*(3), 513–534. https://doi.org/10.1353/dem.0.0068

Thompson, S. (2020). Immigration status, education, and mental health of immigrant children in the United States. *Journal of Child and Family Studies*, *29*(8), 2143-2153. https://doi.org/10.1007/s10826-020-01705-7.

Titzmann, P. F., & Fuligni, A. J. (2015). Immigrants' adaptation to different cultural settings: A contextual perspective on acculturation: Introduction for the special section on immigration. *International Journal of Psychology, 50*(6), 407-412. https://doi.org/10.1002/ijop.12219

Toppelberg, C. O., & Collins, B. A. (2010). Language, culture, and adaptation in immigrant children. *Child and Adolescent Psychiatric Clinics, 19*(4), 697-717. https://doi.org/10.1016/j.chc.2010.07.003

Trejos-Castillo, E., & Vazsonyi, A. T. (2009). Risky sexual behaviors in first- and second-generation Hispanic immigrant youth. *Journal of Youth and Adolescence, 38*(5), 719-731. https://doi.org/10.1007/s10964-008-9369-5

UN Immigration. (2018). *World Migration Report 2018*. (IOM Publications). International Organisation of Migration. https://publications.iom.int/books/world-migration-report-2018

UN Immigration. (2022). *World Migration Report 2022*. (IOM Publications). International Organisation of Migration. https://publications.iom.int/books/world-migration-report-2022

Vaage, A. B., Tingvold, L., Hauff, E., Van Ta, T., Wentzel-Larsen, T., Clench-Aas, J., & Thomsen, P. H. (2009). Better mental health in children of Vietnamese refugees compared with their Norwegian peers - a matter of cultural difference. *Child and Adolescent Psychiatry and Mental Health, 3*(1), 34. https://doi.org/10.1186/1753-2000-3-34.

Vaghela, P., & Ueno, K. (2017). Racial-ethnic identity pairings and mental health of second-generation Asian adolescents. *Sociological Perspectives, 60*(4), 834-852. https://doi.org/10.1177%2F0731121416683159

Verkuyten, M. (2005). *The social psychology of ethnic identity*. New York: Psychology press.

Verkuyten, M. (2005). Ethnic group identification and group evaluation among minority and majority groups: Testing the multiculturalism hypothesis. *Journal of Personality and Social Psychology, 88*(1), 121. https://doi.org/10.1037/0022-3514.88.1.121

Virta, E., Sam, D. L., & Westin, C. (2004). Adolescents with Turkish background in Norway and Sweden: A comparative study of their psychological adaptation, *45*(1):15-25. https://doi.org/10.1111/j.1467-9450.2004.00374.x

Wagemaker, H., Taube, K., Munck, I., Kontogiannopoulou-Polydorides, G., & Martin, M. (1996). Are girls better readers? Gender differences in reading literacy in 32 countries. Amsterdam International Association for the Evaluation of Educational Achievement. Delft, *Eburon Publishers*

Walsh, S. D., Fogel-Grinvald, H., & Shneider, S. (2015). Discrimination and ethnic identity as predictors of substance use and delinquency among immigrant adolescents from the FSU and Ethiopia in Israel. *Journal of Cross-Cultural Psychology, 46*(7), 942-963. https://doi.org/10.1177/2F0022022115588951

Walsh, S. D., Kolobov, T., Raiz, Y., Boniel-Nissim, M., Tesler, R., & Harel-Fisch, Y. (2018). The role of identity and psychosomatic symptoms as mediating the relationship between

discrimination and risk behaviors among first and second-generation immigrant adolescents. *Journal of Adolescence, 64*, 34-47. https://doi.org/10.1016/j.adolescence.2018.01.004

Walsh, S. D., Kolobov, T., & Simanovskaya, O. (2019). What is it about perceived discrimination that can lead immigrant adolescents to alcohol use and delinquency? The mediating role of feelings of alienation. *Substance Use & Misuse, 54*(1), 65-77. https://doi.org/10.1080/10826084.2018.1495738

Walsh, S. D., Sagis-Krebs, M., & Gross, A. (2018). Emotional alienation as a mediator of the relationship between perceived discrimination and alcohol use among immigrant adolescents in Israel. *Journal of Ethnicity in Substance Abuse, 17*(4), 501-518. https://doi.org/10.1080/15332640.2017.1300555

Walsh, S. D., Djalovski, A., Boniel-Nissim, M., & Harel-Fisch, Y. (2014). Parental, peer, and school experiences as predictors of alcohol drinking among first- and second-generation immigrant adolescents in Israel. *Drug and Alcohol Dependence, 138*, 39-47. https://doi.org/10.1016/j.drugalcdep.2014.01.024

Walsh, S. D., Harel-Fisch, Y., & Fogel-Grinvald, H. (2010). Parents, teachers, and peer relations as predictors of risk behaviors and mental well-being among immigrant and Israeli born adolescents. *Social Science & Medicine*, *70*(7), 976-984. https://doi.org/10.1016/j.socscimed.2009.12.010

Washbrook, E., Waldfogel, J., Bradbury, B., Corak, M., & Ghanghro, A. A. (2012). The development of young children of immigrants in Australia, Canada, the United Kingdom, and the United States. *Child Development, 83*(5), 1591-1607. https://doi.org/10.1111/j.1467-8624.2012.01796.x

Watts, T., Duncan, G., Siegler, R., & Davis-Kean, P. (2014). What's past is prologue: Relations between early mathematics knowledge and high school achievement. *Educational Researcher*, *43*(7), 352–360. https://doi.org/10.3102/0013189X14553660

Wechsler, D. (2003). *Wechsler intelligence scale for children* (4th ed.). Sydney: PsychCorp.

Worswick, C. (2004). Adaptation and inequality: Children of immigrants in Canadian schools. *Canadian Journal of Economics, 37*(1), 53-77. https://www.jstor.org/stable/3696098

Zambrana, I. M., Ogden, T., & Zachrisson, H. D. (2020). Can Pre-Academic Activities in Norway's Early Childhood Education and Care Program Boost Later Academic Achievements in Preschoolers at Risk? *Scandinavian Journal of Educational Research*, *64*(3), 440-456, https://doi.org/10.1080/00313831.2019.1577751

Zhu, Z. (2007). Gender differences in mathematical problem-solving patterns: A review of literature. *International Education Journal*, *8*(2), 187–203.

APPENDICES

Appendix I: Side-by-side of original and adapted emotional and behavioural frameworks. *Figure 1.1 Immigrant Youth Adaptation in Contexts: An integrative framework (Motti-Stefanidi et al., 2012), and Figure 1.2 Research model showing interaction and individual-level predictors of individual differences in emotional and behavioural problems among children of immigrants from non-English-speaking countries (inspired by Motti-Stefanidi et al., 2012).*
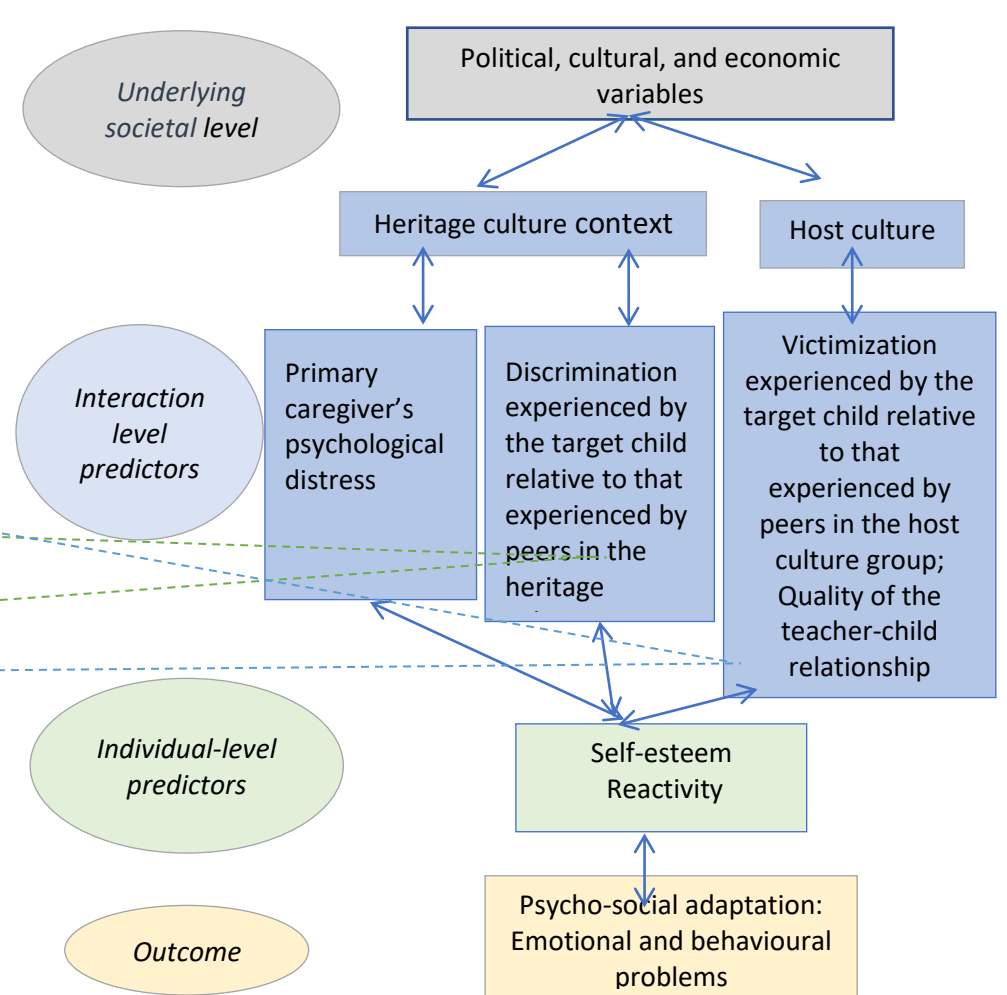

254
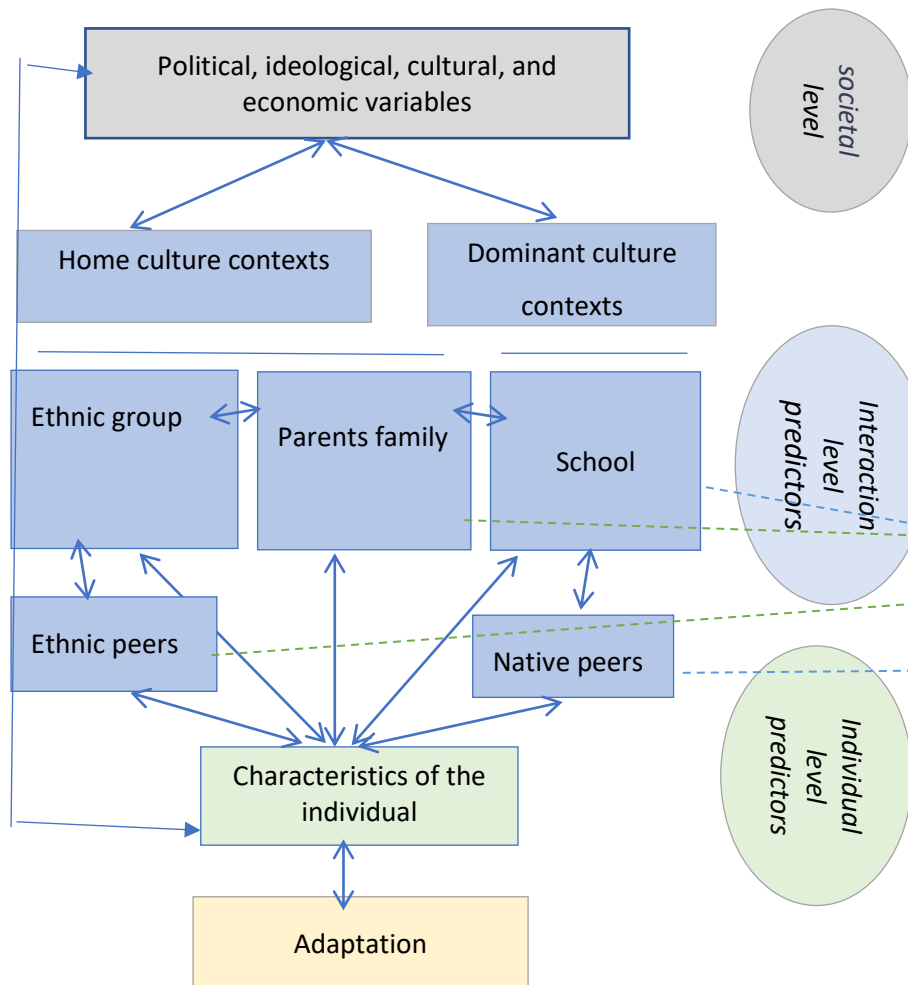
Appendix II: Side-by-side of original and adapted reading and numeracy frameworks. *Figure 1.1 Immigrant Youth Adaptation in Contexts: An integrative framework (Motti-Stefanidi et al., 2012), and Figure 1.3 Research model showing interaction and individual-level predictors of individual differences in reading and numeracy skills among children of skilled immigrants (Adopted from and inspired by Motti-Stefanidi et al., 2012).*
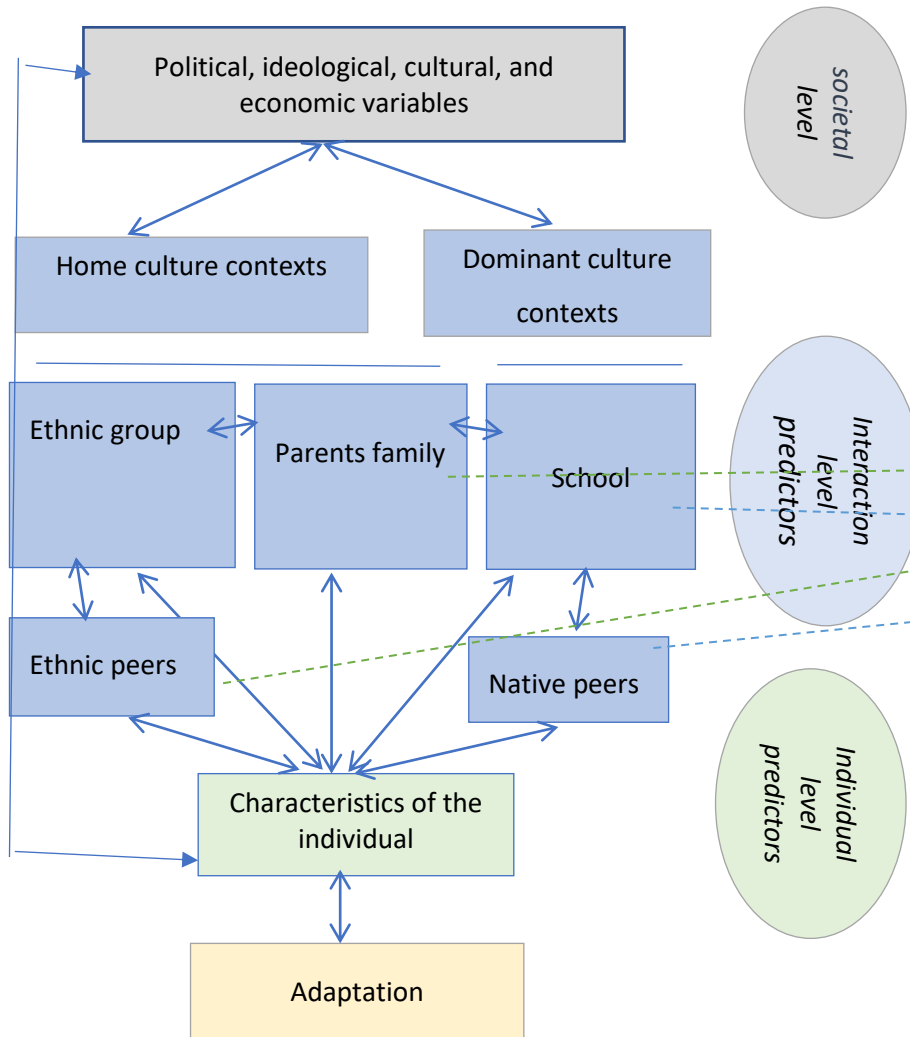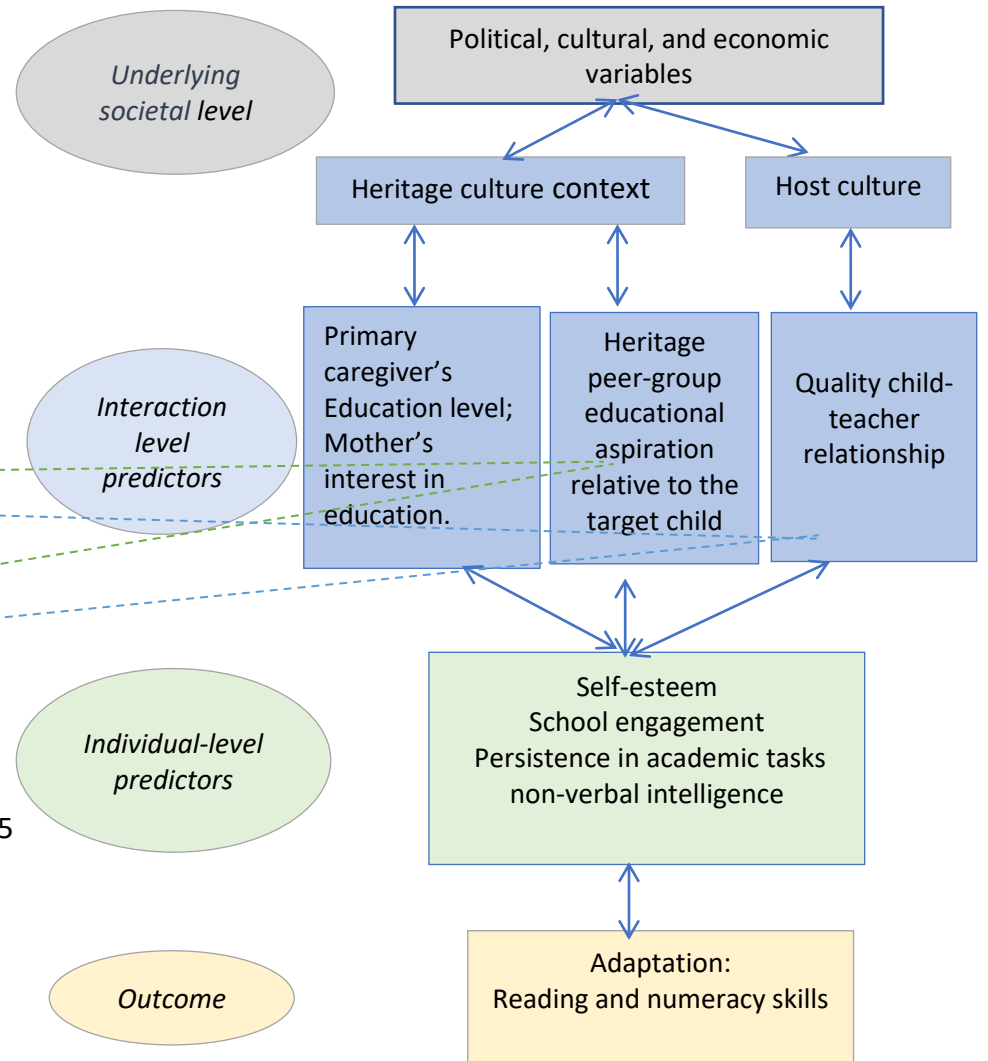
Appendix III: NAPLAN assessment scale according to national minimum standards

"Removed due to copyright restriction"

Source: https://www.nap.edu.au/results-and-reports/how-to-interpret

Appendix IV: NAPLAN scale score equivalence to the band in different Year levels (*Blue font was used to differentiate the national average scores and Band in reading and numeracy performance according to different Grade/Year levels*).

Year level															
Year 3 (2009)				Year 5 (2010)				Year 7 (2012)				Year 9 (2014)			
Reading		Numeracy		Reading		Numeracy		Reading		Numeracy		Reading		Numeracy	
Scale score	Band	Scale score	Band	Scale score	Band	Scale score	Band	Scale score	Band	Scale score	Band	Scale score	Band	Scale score	Band
3.3 – 264.2	1	0.0 – 269.1	1	70.9 – 372.4	3	110.7 – 368.5	3	139.5 - 422.9	4	172.9 – 421.4	4	195.6 - 477.7	5	246.0 – 472.7	5
277.2 – 313.1	2	282.9 – 321.4	2	384.8 – 420.1	4	379.2 – 419.4	4	431.7 - 472.0	5	428.9 – 475.1	5	485.5 - 528.7	6	479.4 – 526.1	6
324.2 – 366.7	3	333.7 – 369.7	3	431.5 – 476.9	5	429.0 – 476.3	5	479.6 - 523.5	6	481.1 - 527.0	6	535.5 - 575.9	7	531.4 – 577.56	7
377.0 – 418.6	4	381.6 – 418.2	4	488.6 – 525.3	6	485.8 – 524.9	6	530.7 - 576.2	7	532.7 - 578.7	7	582.8 – 626.9	8	582.7 – 630.9	8
429.4 – 477.1	5	430.9 – 472.0	5	538.4 – 567.1	7	535.2 – 580.5	7	584.4 - 630.6	8	584.7 - 630.6	8	635.1 - 683.5	9	636.6 – 681.3	9
491.0 – 684.7	6	487.2 – 763.3	6	582.9 – 841.6	8	593.4 – 798.7	8	641.7 – 865.8	9	637.9 - 922.8	9	695.6 - 907.5	10	688.6 – 920. 0	10

Source: https://www.nap.edu.au/results-and-reports/how-to-interpret/score-equivalence-tables

Appendix V: Child's self-reported emotional and behavioural problems

Strengths and Difficulty Questionnaire **(SDQ) (Goodman, 1997)**

a) I am restless; I cannot stay still for long. (Hyperactivity)

b) I am constantly fidgeting or squirming. (Hyperactivity)

c) I am easily distracted; I find it difficult to concentrate. (Hyperactivity)

d) I think before I do things. (Hyperactivity)

e) I finish the work I am doing; my attention is good. (Hyperactivity)

f) I get a lot of headaches, stomach-aches, or sickness. (Emotional)

g) I worry a lot. (Emotional)

h) I am often unhappy, depressed, or tearful. (Emotional)

i) I am nervous in new situations. I easily lose confidence. (Emotional)

j) I have many fears, I am easily scared. (Emotional)

k) I get very angry and lose my temper. (Conduct problems)

l) I usually do as I am told. (Conduct problems)

m) I fight a lot. I can make other people do what I want. (Conduct problems)

n) I am kind to younger children. (Conduct problems)

o) I am often accused of lying or cheating. (Conduct problems)

p) I would rather be alone than with people of my age. (Peer relationship)

q) I have one good friend or more. (Peer relationship)

r) Other people my own age generally like me. (Peer relationship)

s) Other children or young people pick on me or bully me. (Peer relationship)

t) I get along better with adults than people my age. (Peer relationship)

Appendix VI: Primary caregiver's self-reported mental health problems

Kessler Psychological Distress Scale (Kessler, 1994)

1. In the past 4 weeks how often did you feel -Nervous

2. In the last 4 weeks how often did you feel – Hopeless

3. In the last 4 weeks how often did you feel – Restless or fidgety

4. In the last 4 weeks how often did you feel – everything was an effort

5. In the last 4 weeks how often did you feel – so sad that nothing you cheer you up

6. In the last 4 weeks how often did you feel – Worthless

Appendix VII: Child-reported Quality child-teacher relationship

1. I like my teachers

2. My teachers respect my feelings

3. My teachers understand me

4. I trust my teachers

5. My teachers pay a lot of attention to me

6. I get along with my teachers

7. My teachers are proud of things I do

8. Rely on my teacher

Appendix VIII: Child-reported Victimization of bullying

1. Kids hit or kicked me on purpose

2. Kids grabbed or shoved me on purpose

3. Kids threatened to hurt me or take my things

4. Kids saying mean things to me or called me names

5. Kids tried to keep others from being my friend

6. Kids did not let me join in what they were doing

7. Kids send me a mean text message/email

Appendix IX: Teacher rated Child's school engagement

1. Works hard
2. Relates well to other students
3. Passive and withdrawn
4. Attentive
5. Disruptive
6. Late
7. Absent
8. Completes homework

## Appendix X: Distribution of three outcomes of the three groups at 10 years

(a): Emotional and behaviour problems

Emotional and behavioural problems

Children of NESB Skilled Immigrants

Mean = 8.68
Std. Dev. = 4.905
N = 204

Emotional and behavioural problems

Children of ESB Skilled Immigrants

Mean = 9.49
Std. Dev. = 5.166
N = 166

Emotional and behavioural problems

Children of Native-born Skilled parents

Mean = 9.50
Std. Dev. = 5.755
N = 2,692
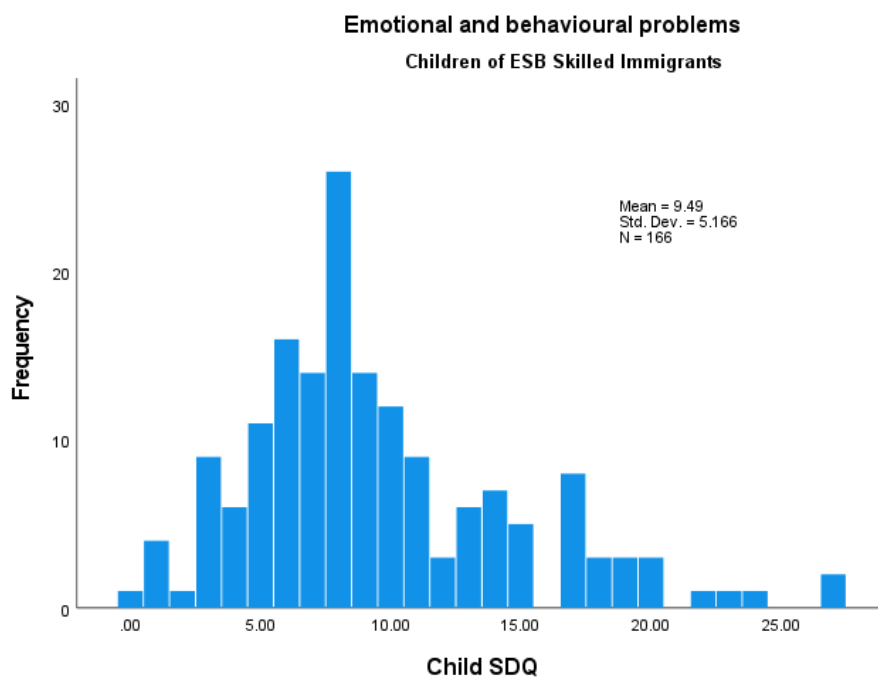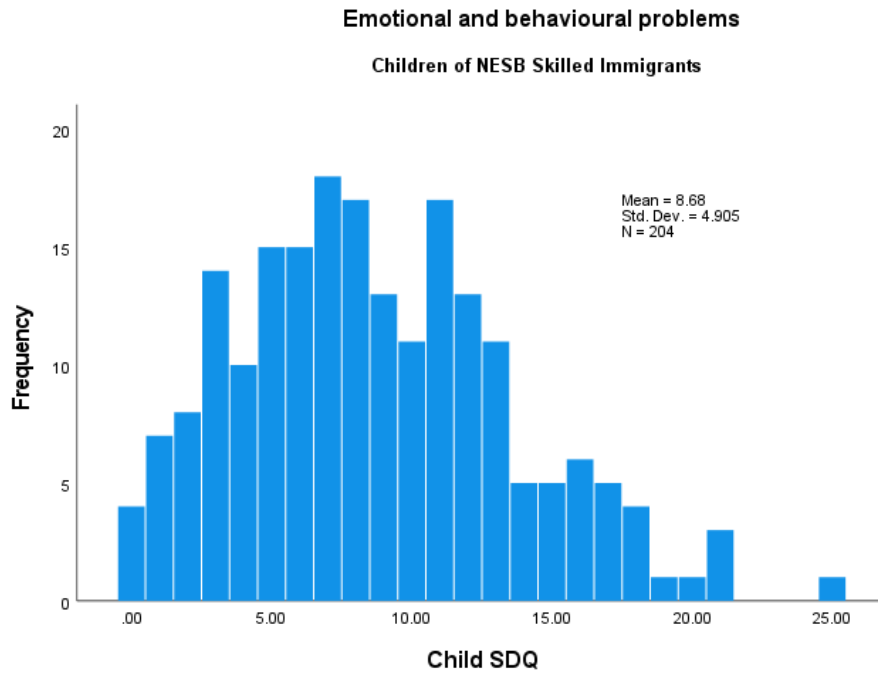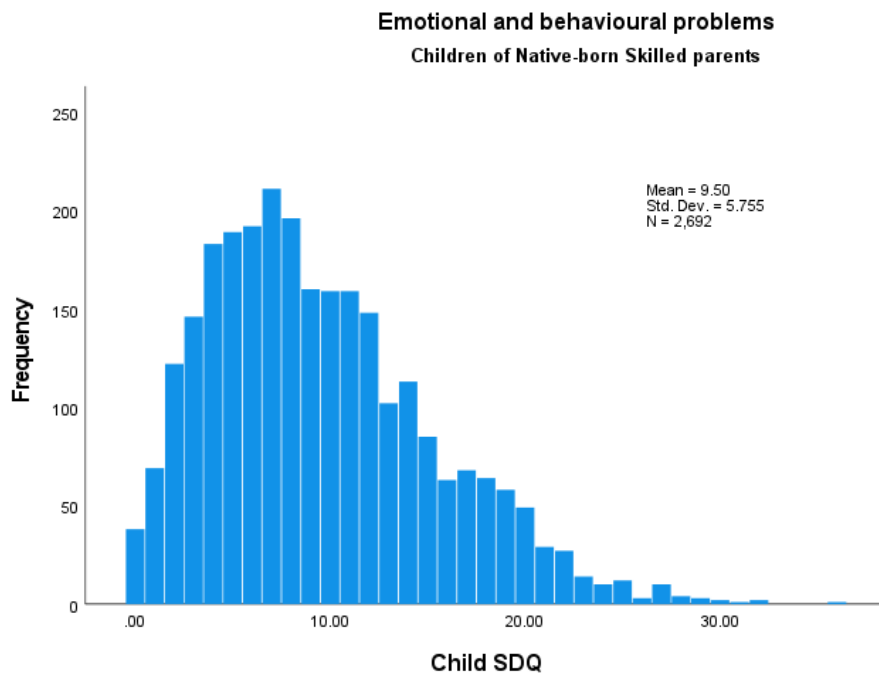
Note: The SDQ distributions for three groups of children of age 10 years exhibit a mild right-skewness, meaning they are slightly skewed towards the higher values on the right tail. Specifically, for children of NESB skilled immigrants, the average SDQ score was 8.68, with a standard deviation of 4.91. The mean SDQ score was comparatively elevated (Mean=9.49, SD=5.17) for children of ESB skilled migrants. The average SDQ score for children of Native-born skilled parents was nearly identical to that of children from ESB skilled migrants.
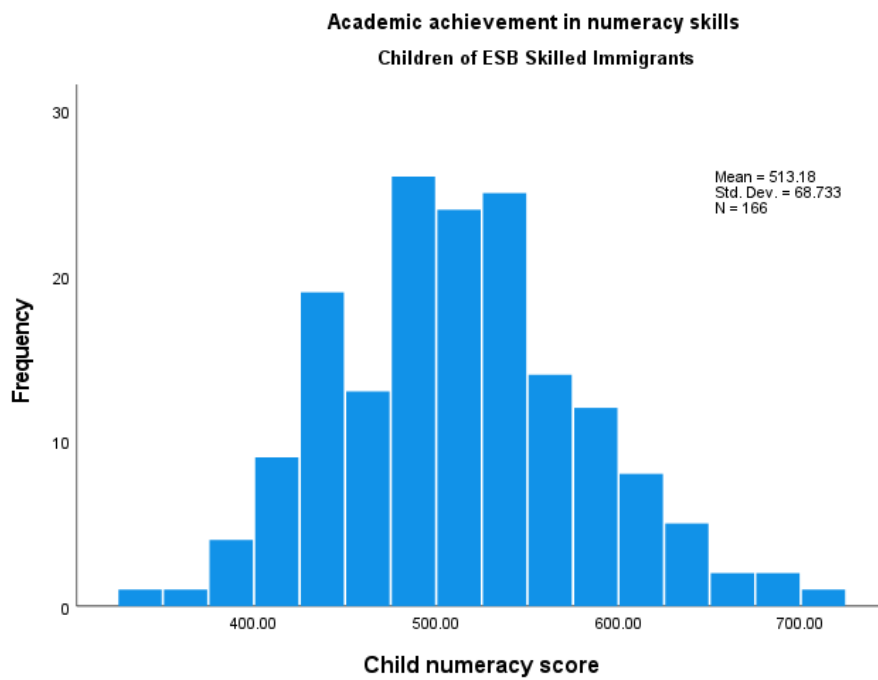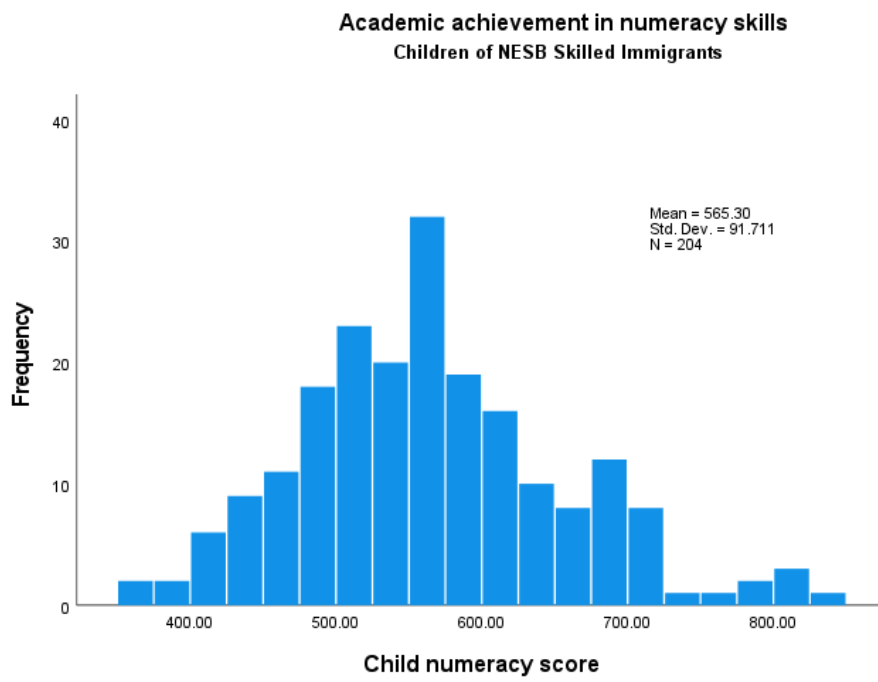
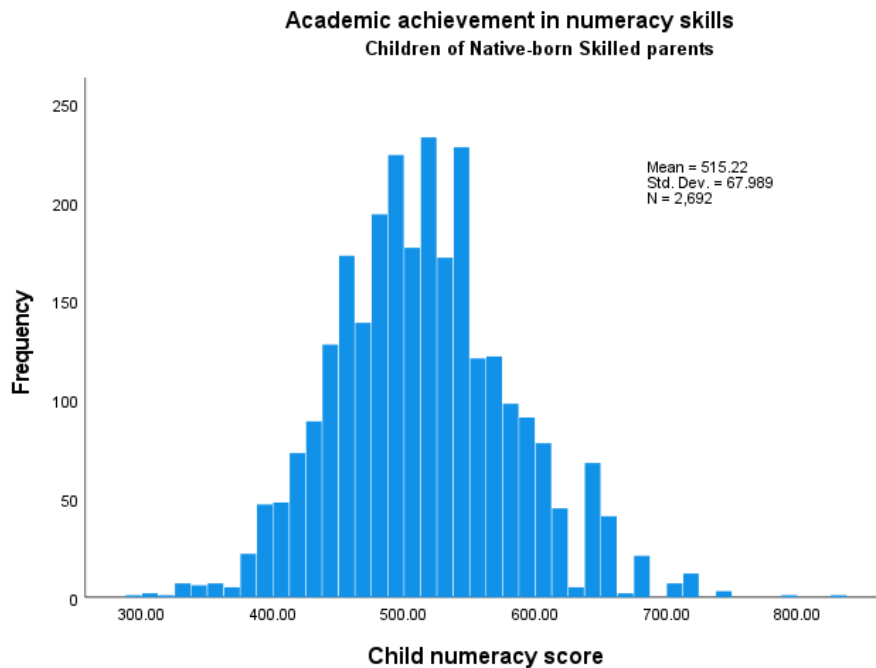**(b): Academic achievement in reading performance**

Academic achievement in reading skills
Children of NESB Skilled Immigrants

Mean = 546.43
Std. Dev. = 76.171
N = 204

Academic achievement in reading skills
Children of ESB Skilled Immigrants

Mean = 531.91
Std. Dev. = 72.134
N = 166

Academic achievement in reading skills

Children of Native-born Skilled parents

Mean = 531.41
Std. Dev. = 77.358
N = 2,692
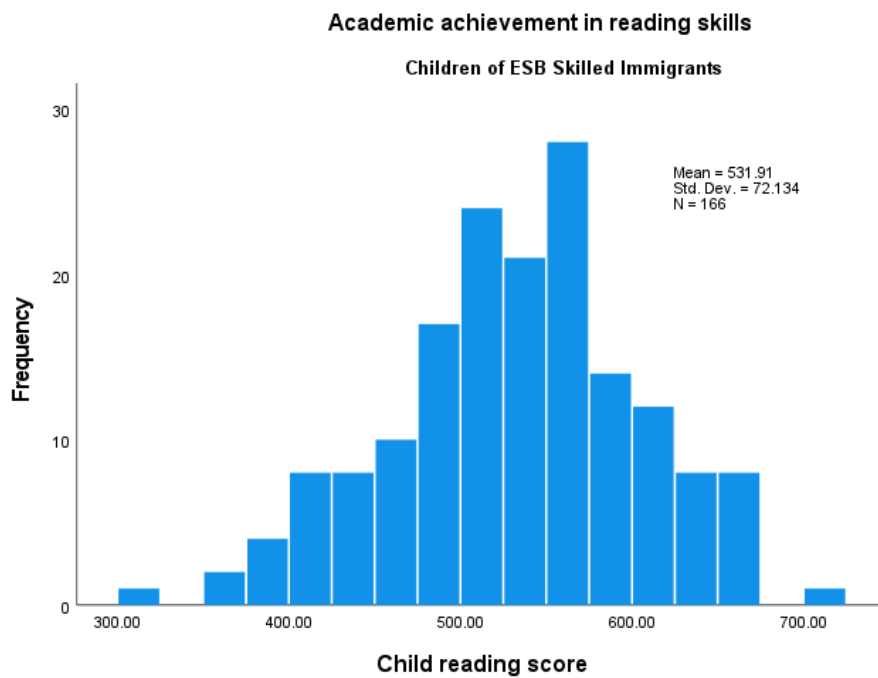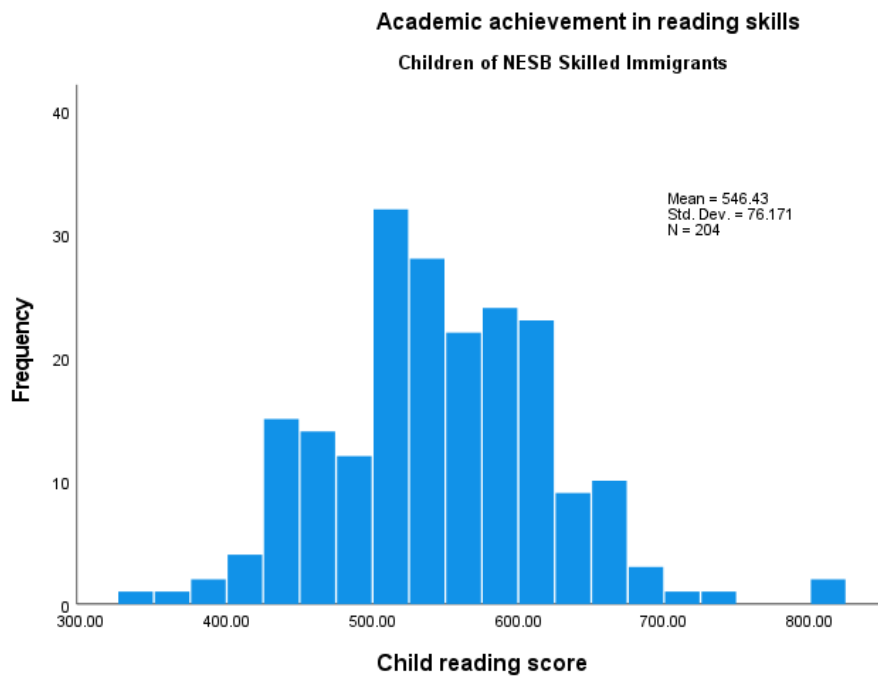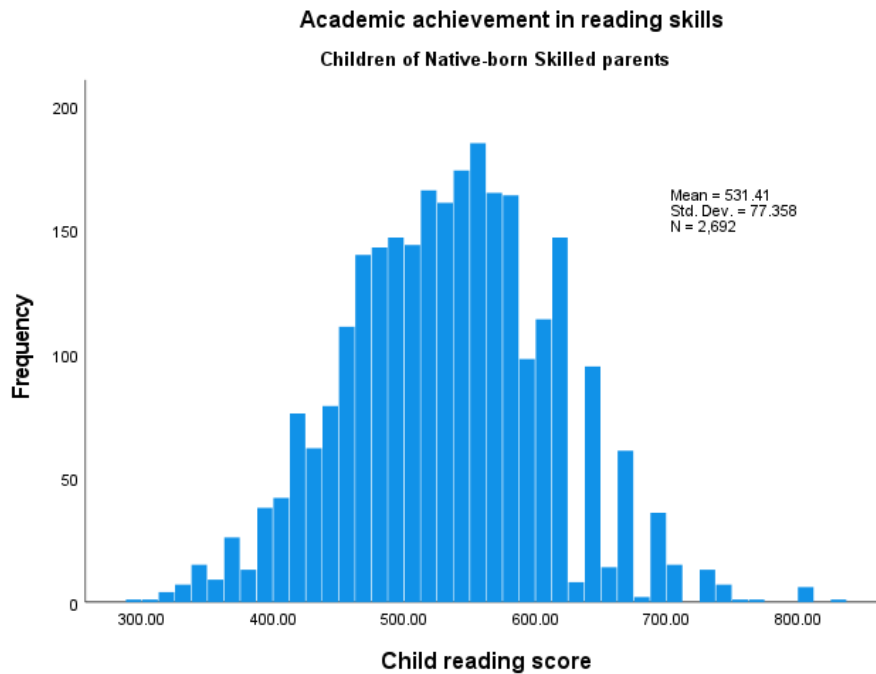
Note: The distributions of reading scores were mostly symmetrical across the three groups of children of age 10 years old, with only a few extreme values present in each group. The mean reading score was relatively higher (Mean=546.43, SD=76.17) for children of NESB skilled immigrants in comparison to children of ESB skilled immigrants (Mean=531.91, SD=72.13), as well as children of Native-born skilled parents (Mean=531.41, SD=77.36).

.

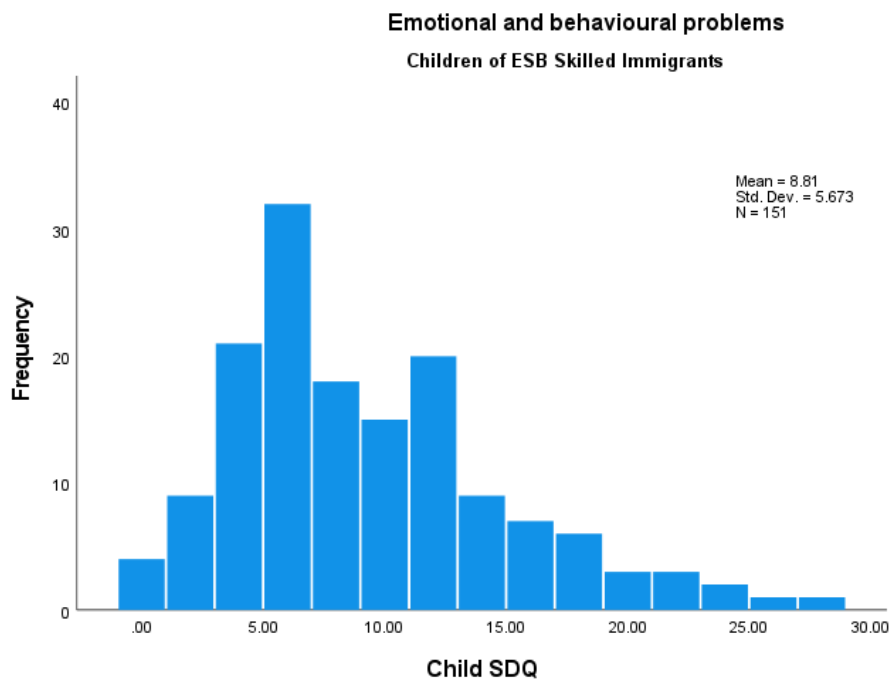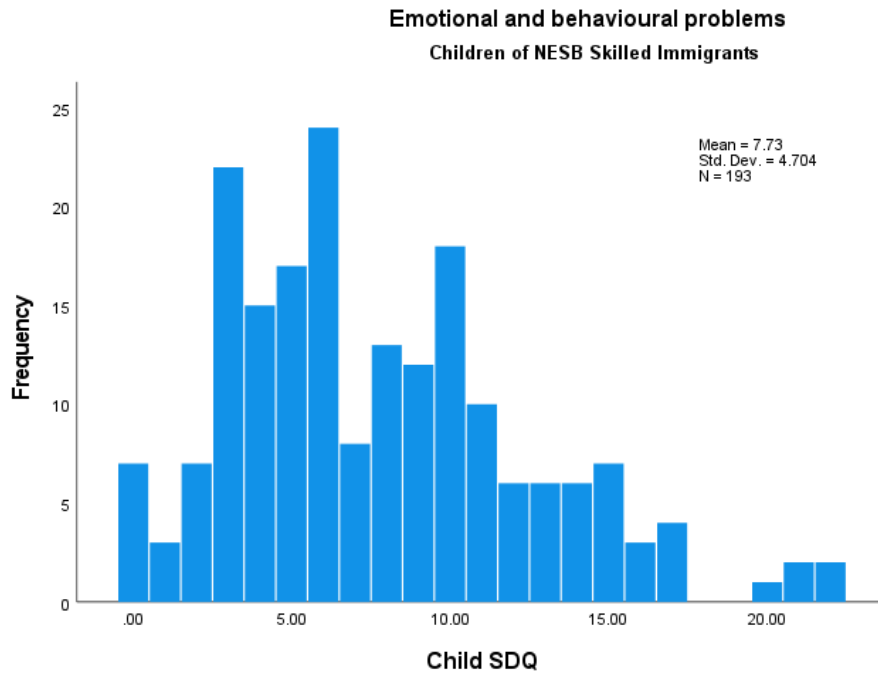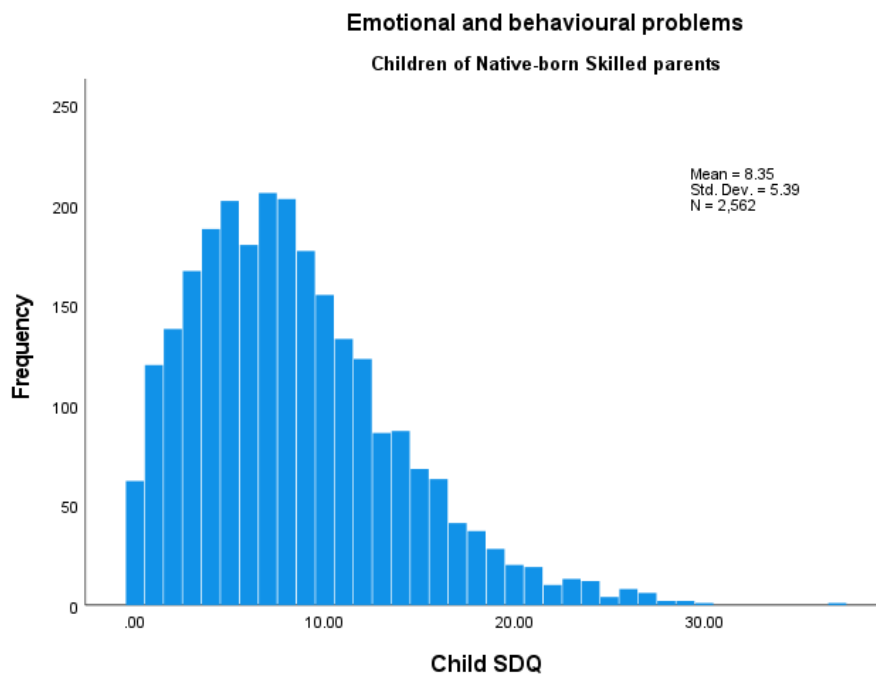*(c): Academic achievement in numeracy performance*

Academic achievement in numeracy skills
Children of NESB Skilled Immigrants

Mean = 565.30
Std. Dev. = 91.711
N = 204

Frequency

Child numeracy score

Academic achievement in numeracy skills
Children of ESB Skilled Immigrants

Mean = 513.18
Std. Dev. = 68.733
N = 166

Frequency

Child numeracy score

Academic achievement in numeracy skills
Children of Native-born Skilled parents

Mean = 515.22
Std. Dev. = 67.989
N = 2,692

Note: Similar to reading score, the distributions of numeric scores were nearly symmetrical across the three groups of children of 10 years old. However, a slight positive skewness was observed for both children of ESB skilled immigrants and children of Native-born skilled parents. For children of NESB skilled immigrants, the mean numeracy score was 565.30, with a standard deviation of 91.71. The mean scores were quite comparable for children of ESB skilled immigrants (Mean=513.18, SD=68.73) and children of Native-born skilled parents (Mean=515.22, SD=67.99), but they were relatively lower than those of children from NESB skilled immigrants. The higher mean score in the NESB skilled immigrants' group was influenced by several children who achieved a score of 800, which contributed to the overall higher average.

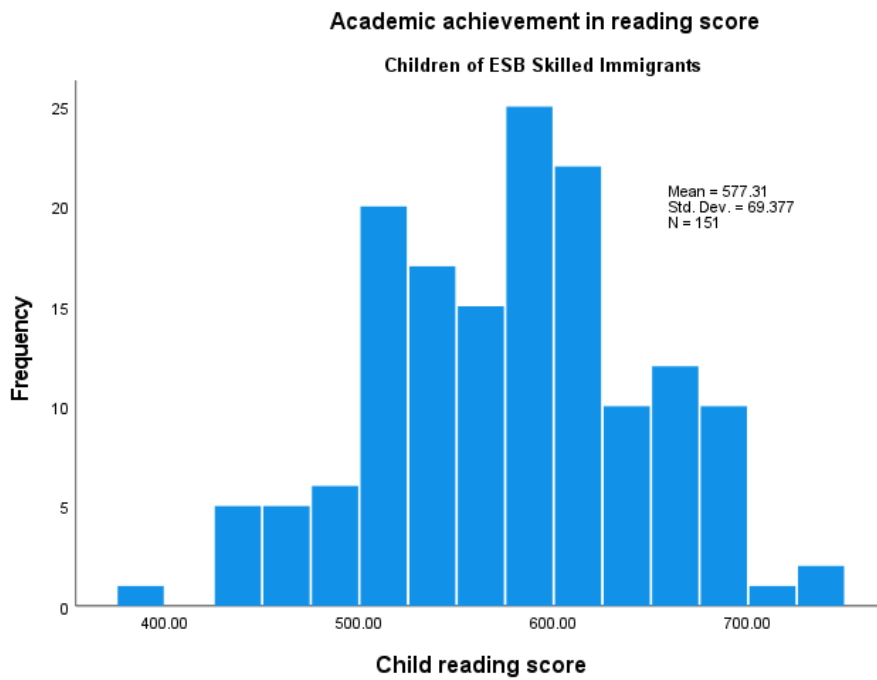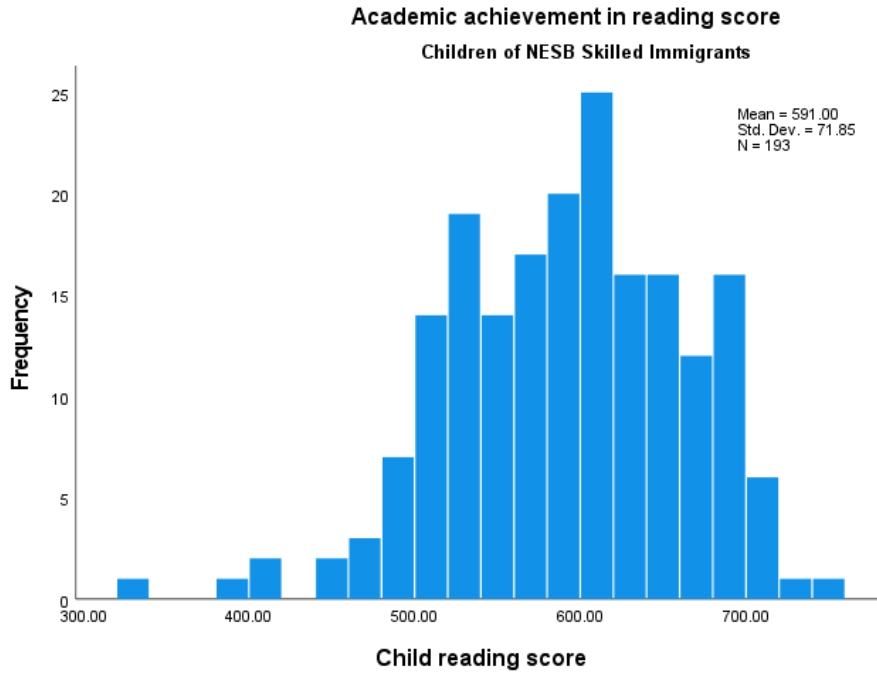*Appendix XI: Distribution of three outcomes of the three groups at 12 years*

(a): Emotional and behaviour problems

Emotional and behavioural problems
Children of NESB Skilled Immigrants

Mean = 7.73
Std. Dev. = 4.704
N = 193

Frequency / Child SDQ

Emotional and behavioural problems
Children of ESB Skilled Immigrants

Mean = 8.81
Std. Dev. = 5.673
N = 151

Frequency / Child SDQ

Emotional and behavioural problems

Children of Native-born Skilled parents
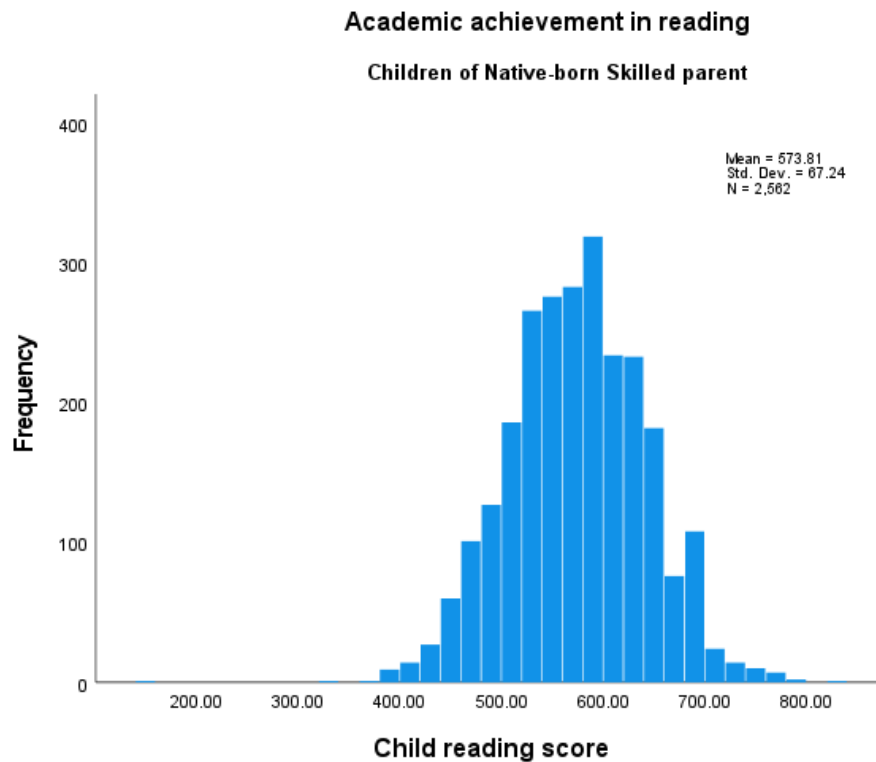
Mean = 8.35
Std. Dev. = 5.39
N = 2,562

Note: The distributions of SDQ scores have shown a positive skewness for all three groups of children. This positive skewness was slightly higher for children of ESB skilled immigrants and Native-born children, compared to children of NESB skilled immigrants. These two groups had a maximum SDQ score of around 30, which resulted in a comparatively higher skewness when compared to children of NESB skilled immigrants (maximum SDQ~20). The mean SDQ score of 7.73 (SD=4.70) was comparatively lower than children of Native-borne skilled parents (Mean=8.35, SD=5.39) and children of ESB skilled immigrants (Mean=8.81, SD=5.67).

(b): Academic achievement in reading performance

Academic achievement in reading score
Children of NESB Skilled Immigrants

Mean = 591.00
Std. Dev. = 71.85
N = 193

Academic achievement in reading score
Children of ESB Skilled Immigrants

Mean = 577.31
Std. Dev. = 69.377
N = 151

271

Academic achievement in reading

Children of Native-born Skilled parent

Mean = 573.81
Std. Dev. = 67.24
N = 2,562

Note: The distributions of reading scores were nearly symmetrical across the three groups of children. However, a few extreme scores appeared in the lower tail of the distribution for children of NESB skilled immigrants. Nonetheless, overall, the scores for all three groups were within a range of approximately 400 to 700. The mean reading score was relatively higher (Mean=591, SD=71.85) for children of NESB skilled immigrants than children of ESB skilled immigrants (Mean=577.31, SD=69.38) and children of Native-born skilled parents (Mean=573, SD=67.24).

(c): Academic achievement in numeracy performance

Academic achievement in numeracy score

Children of NESB Skilled Immigrants

Mean = 627.20
Std. Dev. = 95.46
N = 193

Academic achievement in numeracy score

Children of ESB Skilled Immigrants

Mean = 573.47
Std. Dev. = 68.217
N = 151

273

Academic achievement in numeracy score

Children of Native-born Skilled parents

Mean = 572.77
Std. Dev. = 66.353
N = 2,562
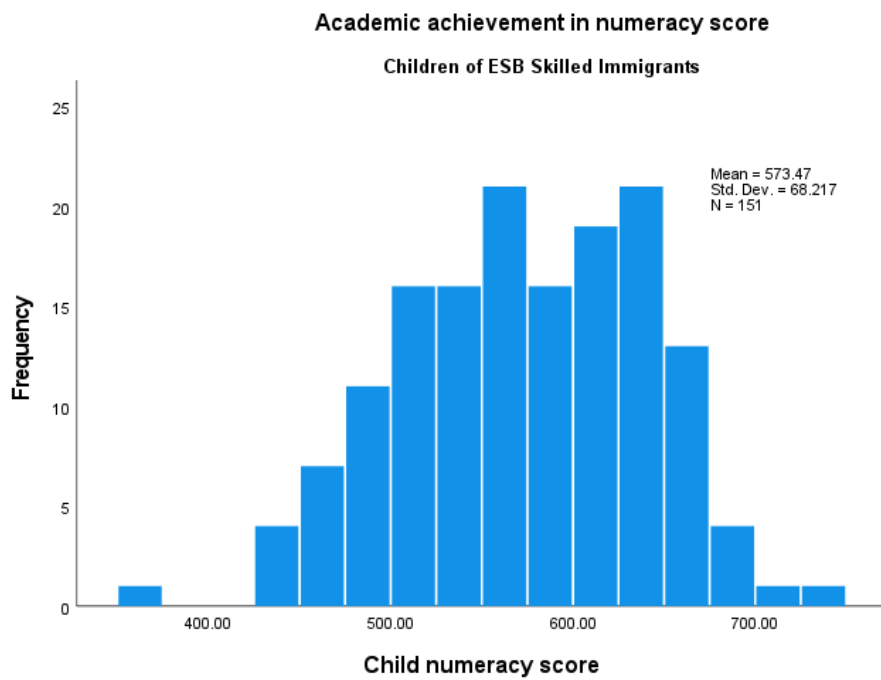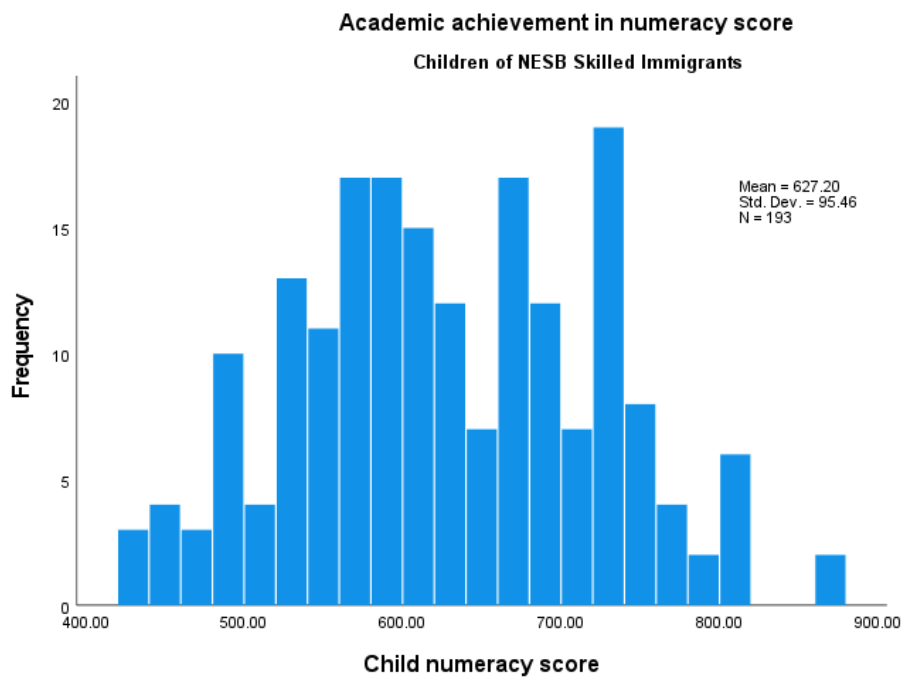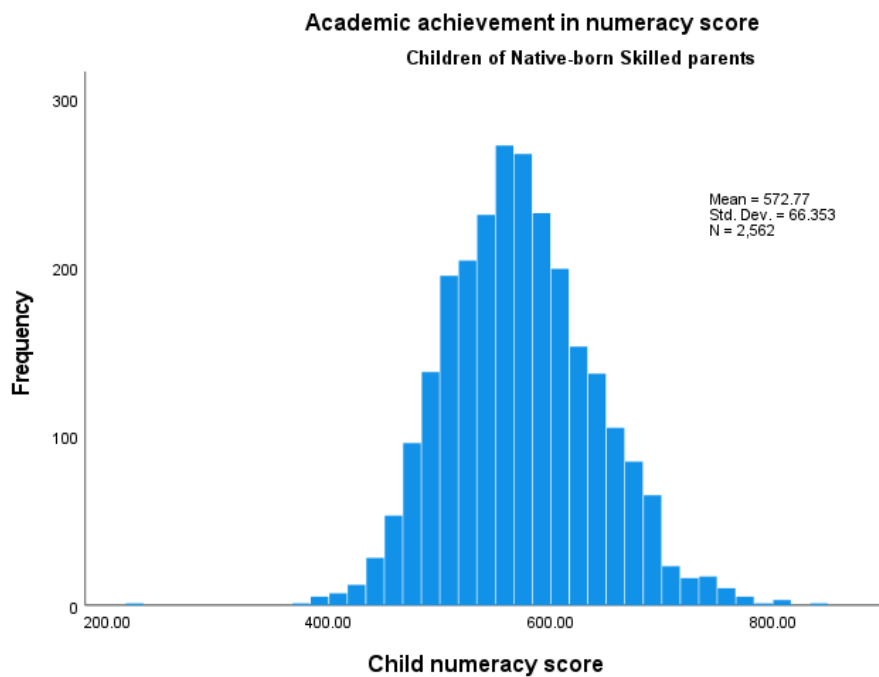
Note: The numeracy score distribution was perfectly symmetrical for children of Native-born skilled parents. However, the distribution was approximately symmetrical for children of NESB skilled immigrants and showed a slight skewness in the lower tail for children of ESB skilled immigrants. This was attributed to a few extreme cases with scores less than 400. The mean numeracy score for children of NESB skilled immigrants was about 50 points higher (Mean = 627.20, SD = 95.46) compared to the other two counterparts. Both groups had nearly identical mean numeracy scores (Mean = 573) with standard deviations ranging between 66 and 68.

***Appendix XII: Distribution of three outcomes of the three groups at 14 years***

(a): Emotional and behaviour problems

Emotional and behavioural problems
Children of Native-born Skilled parents

Mean = 9.29
Std. Dev. = 5.631
N = 2,304
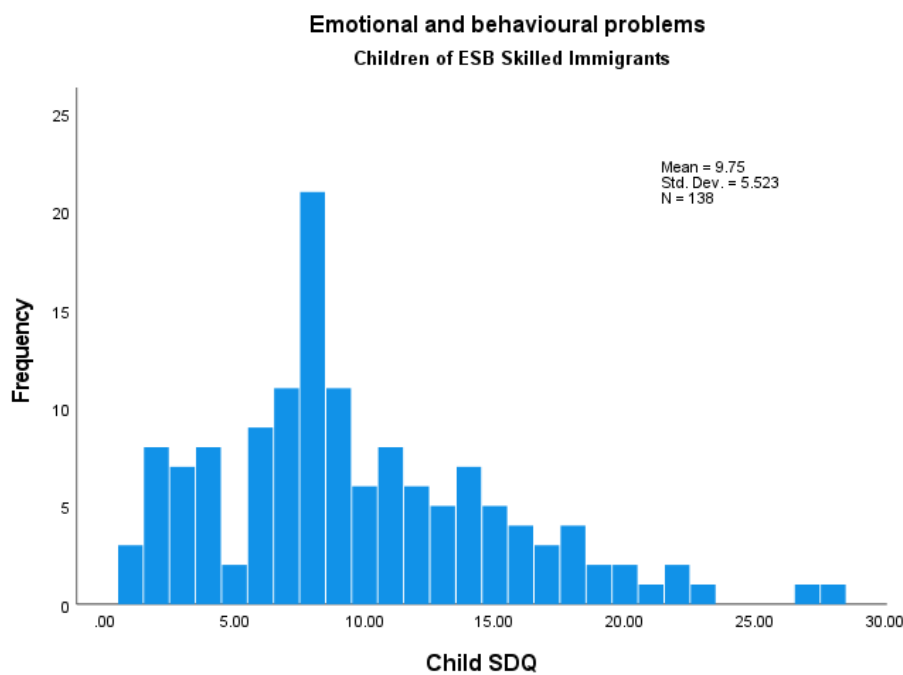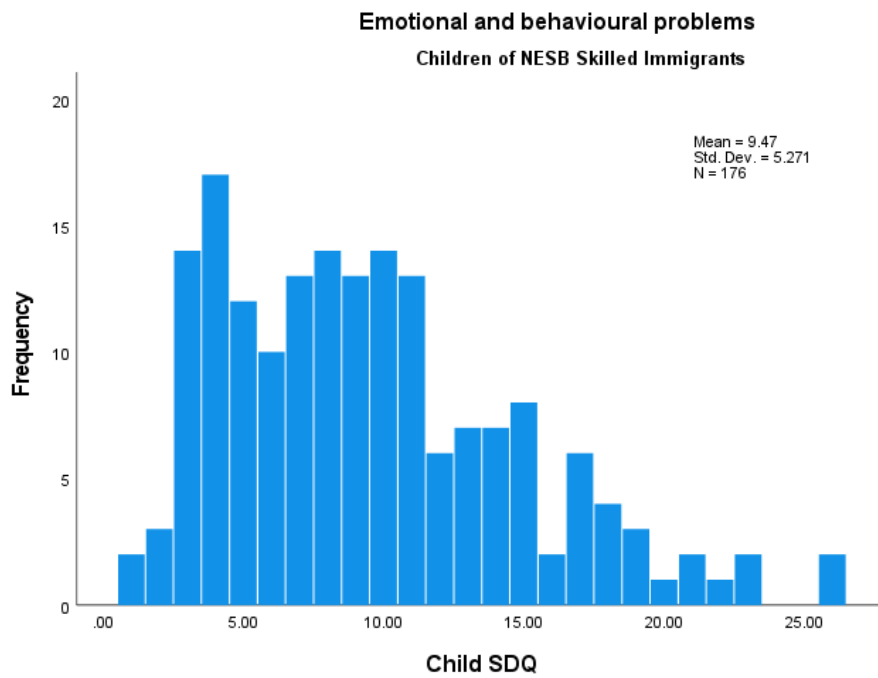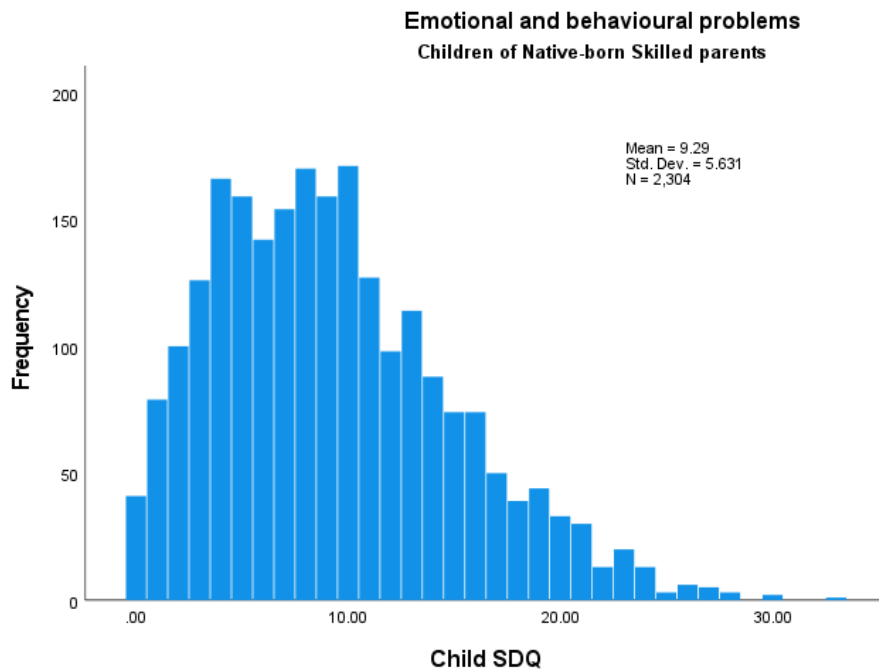
Note: The distribution of SDQ scores among 14-year-old children exhibits a positive skewness to the right. The extended tail on the right side of the distribution suggests a substantial number of children have smaller SDQ score of ranges 5-15, compared to fewer children have greater SDQ score of ranges 20-25 for all three groups. The mean SDQ scores for three groups were quite comparable, ranging from 9.29 (SD = 5.6) for children of Native-born skilled parents to 9.75 (SD = 5.5) for children of ESB skilled immigrants.

(b): Academic achievement in reading performance


Academic achievement in reading
Children of NESB Skilled Immigrants

Mean = 637.44
Std. Dev. = 62.09
N = 176

Academic achievement in reading
Children of ESB Skilled Immigrants

Mean = 624.25
Std. Dev. = 60.532
N = 138

Academic achievement in reading
Children of Native-born Skilled parents

Mean = 612.09
Std. Dev. = 62.861
N = 2,304
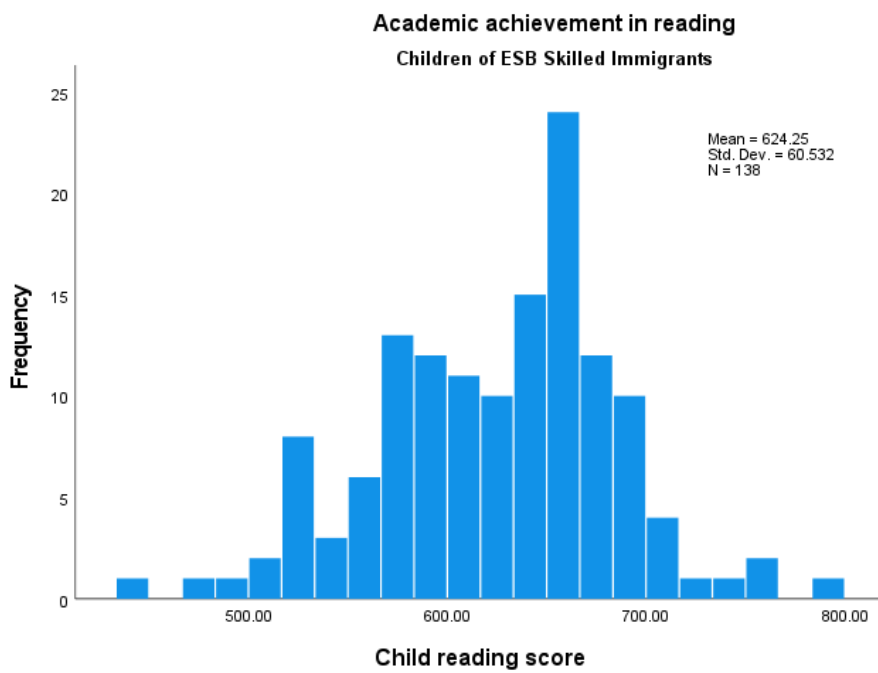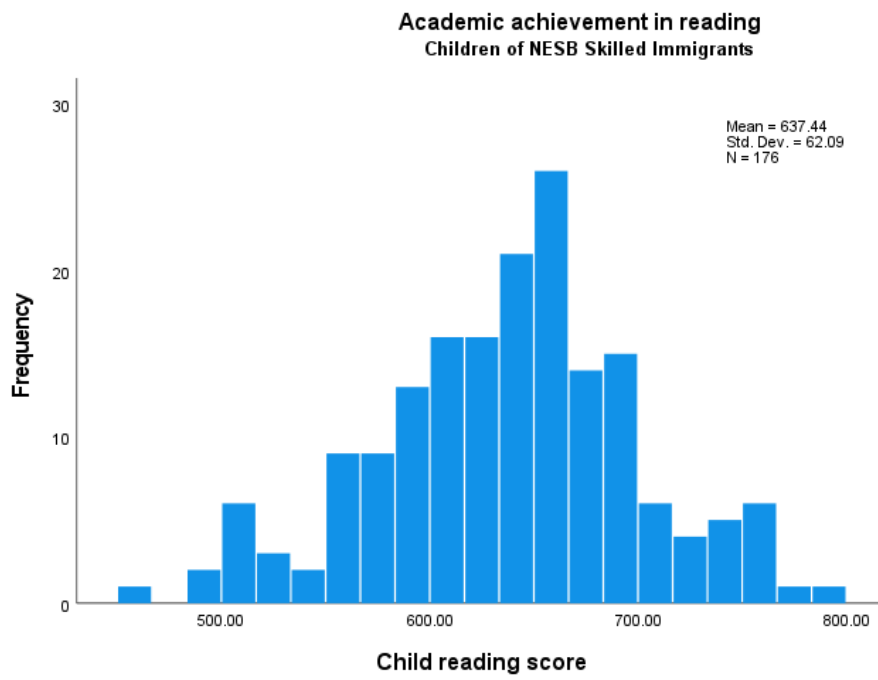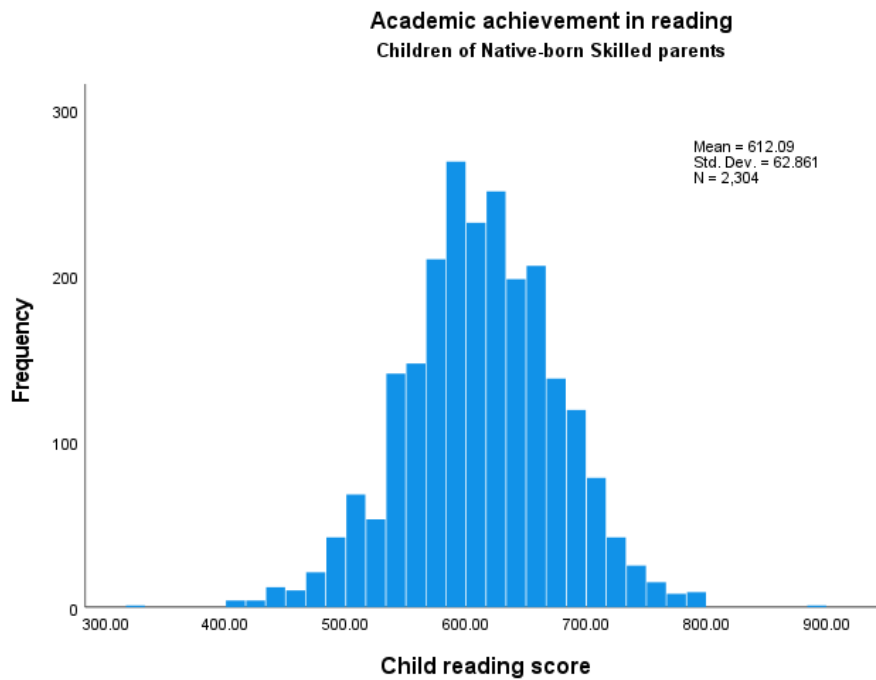
Note: The distribution of reading score was almost symmetrical for children of Native-born skilled parents due to large number of children (n=2304) in this group. However, the distributions for children of NESB and ESB skilled immigrants were slightly skewed to the left. The mean reading score of children of NESB skilled immigrants was largest (Mean=637.4, SD=62.1) followed by 624.3 (SD= 60.5) for children of ESB skilled immigrants and 612.1 (SD=62.9) for children of Native-born parents.

(c): Academic achievement in numeracy performance

Academic achievement in numeracy
Children of NESB Skilled Immigrants

Mean = 679.59
Std. Dev. = 83.004
N = 176

Academic achievement in numeracy
Children of ESB Skilled Immigrants

Mean = 625.54
Std. Dev. = 64.668
N = 138

Academic achievement in numeracy

Children of Native-born Skilled parents

Mean = 619.04
Std. Dev. = 63.877
N = 2,304
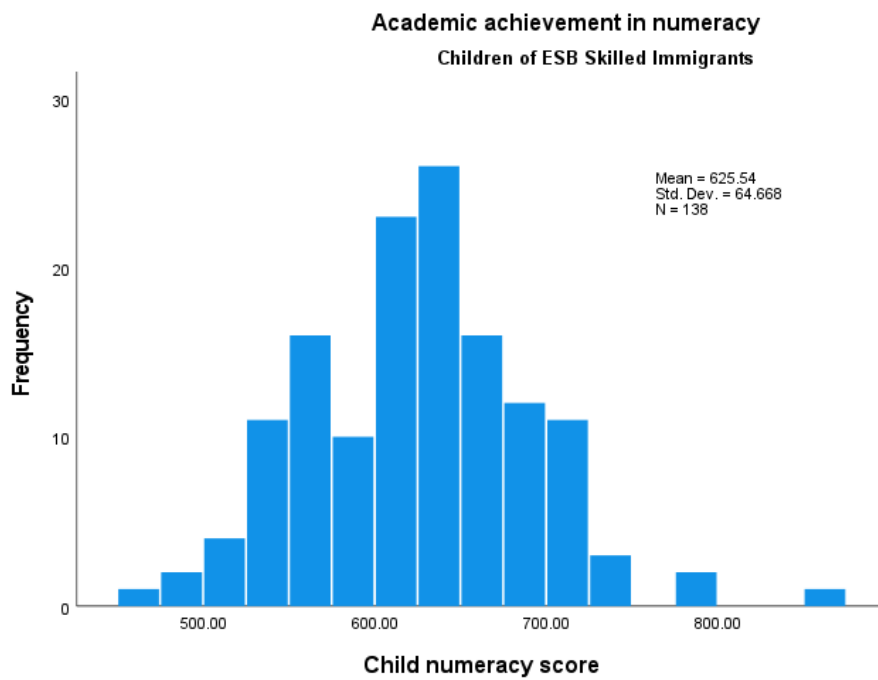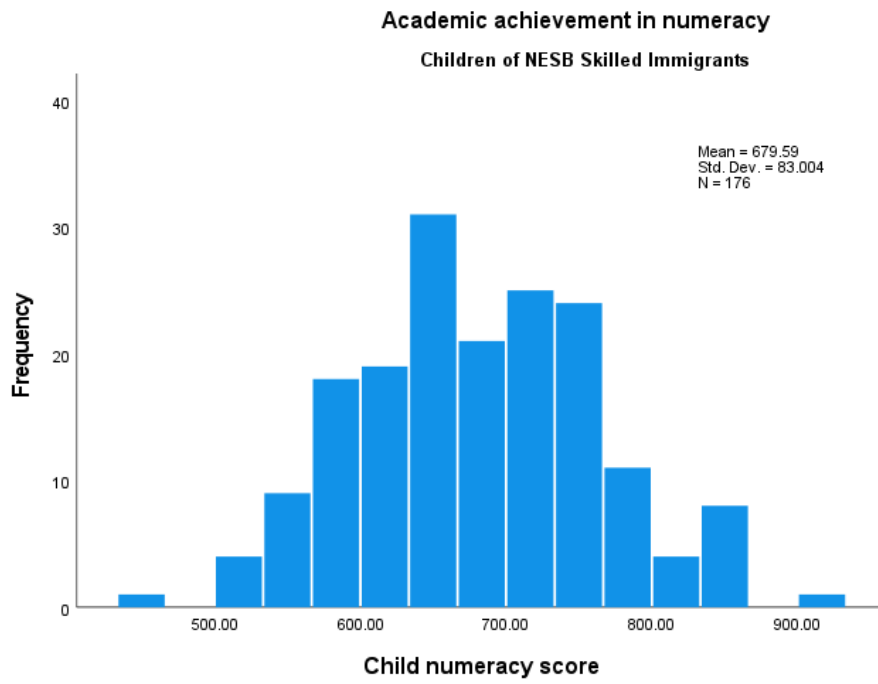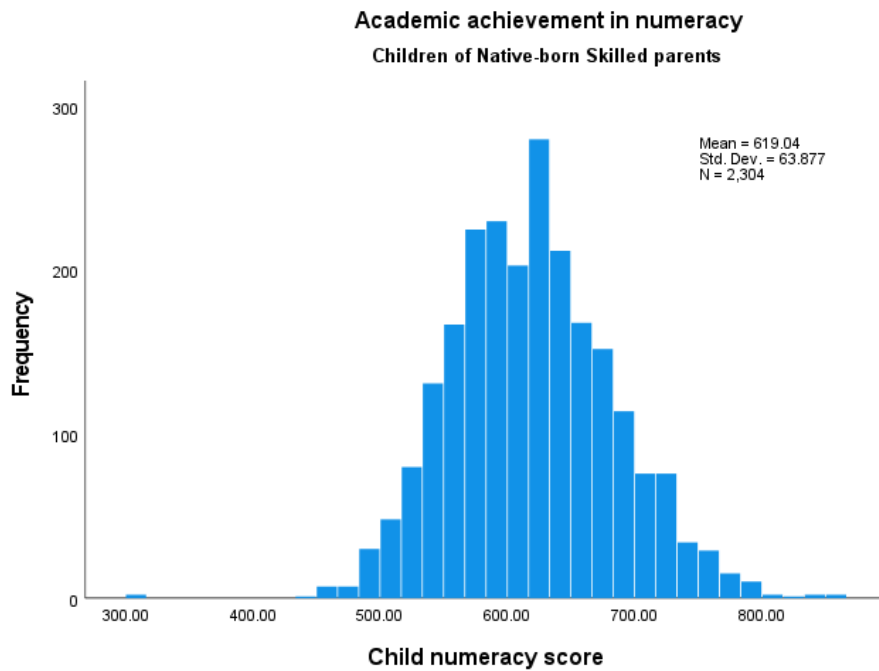
Note: Similar to reading score, the distribution of numeracy scores was also symmetrical for children of Native-born skilled parents. The distributions of numeracy scores were approximately symmetric due to the small number of children in both groups. The mean numeracy scores were relatively higher than reading scores for all three groups. Similar to reading score, children of NESB skilled immigrants scored the largest (Mean=679.6, SD=83) compared children of ESB skilled immigrants (Mean=625.5, SD=64.7) and children of Native-born parents (Mean=619, SD=63.9).