A STUDY OF THE OUTCOMES OF
COLLABORATIVE AND STRUCTURED SUPPORT
FOR PRIMARY SCHOOL TEACHERS
TO FACILITATE INCLUSIVE EDUCATION
FOR STUDENTS WITH AN AUTISM SPECTRUM DISORDER

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ABSTRACT

Australian commonwealth legislation and government education policies (Victoria, Australia) indicate a commitment to schools becoming more inclusive and responsive to the diversity of students' needs. The current study was designed as a model of how policy might become part of practice for primary school students who have an Autism Spectrum Disorder. The implemented model was based on guidelines in the Autism Spectrum Disorder Inclusion Collaboration Model (Simpson, de Boer-Ott, & Smith-Myles, 2003) and the Integrative Model of Effective Educational Intervention (Kunce, 2003). Key elements of the model were: whole school training, ongoing training and support of the teacher (and teacher aide) in relation to a particular student, parental involvement, and involvement of an autism consultant for four months. Particular emphasis was placed on the need for collaborative and equitable relationships between the parties supporting the student and the benefit of structured interventions across multiple domains of student functioning.

Eighteen primary school students (5-12 years) participated in the study across nine mainstream rural and regional schools. The primary aim of the study was to assess the effect of support of teachers on student behaviour. Students were allocated into one of two groups. In the first time period Group One received the intervention and Group Two was a wait-control group. In the second time period Group Two received the intervention. Quantitative measures of the controlled part of the study were undertaken in relation to behaviours specifically related to an Autism Spectrum Disorder using questions from the Diagnostic Interview for Social and Communication Disorders (DISCO). In the first time period results indicated an improvement in Total behaviours specifically related to Autism Spectrum Disorders and particularly Self-care, Communication, Social Interaction, and Repetitive and Stereotyped Behaviours. Similar results were found in the second time period. Measures of executive functioning and clinical problem behaviours using other instruments were also undertaken pre and post each group's intervention period. No significant changes in executive functioning

were evident. However, teacher and parent report both indicated a significant improvement in Attention Problems and Aggressive Behaviours for the sample. Teacher and parent gains were also measured qualitatively. Teachers reported marked gains in knowledge of Autism Spectrum Disorders and educational interventions and parents reported positive gains in knowledge and especially gains from increased communication with teachers.

DECLARATION

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

Signature:

Date:

ACKNOWLEDGMENTS

CHAPTER 1
INTRODUCTION

Current government and educational policy about inclusion

In the Commonwealth of Australia the need for schools and teachers to include students with an Autism Spectrum Disorder (ASD) is clear in the *Disability Standards for Education* 2005, which were formulated by the Commonwealth Attorney-General under the *Disability Discrimination Act* 1992. These Standards state:

> [An educational institution] must take reasonable steps to ensure that [a student with a disability] is able to participate in the courses or programs provided by the educational institution, and use the facilities and services provided by it, on the same basis as a student without a disability, and without experiencing discrimination. (paragraph 5.2 (1))

In the State of Victoria the obligation of education providers to work toward the establishment of inclusive school communities has been made clear in the *Blueprint for Government Schools* (Department of Education and Training, 2003). The *Blueprint* began a process of educational reform that is ongoing. According to the *Program for Students with Disabilities and Language Support Program Handbook* (Department of Education and Training, 2006c), "The Department [of Education and Training] is committed to delivering an inclusive education system that ensures all students have access to a quality education to meet their diverse needs" (p.3).

Following the publication of the *Blueprint*, a draft paper was released entitled, "Inclusive schools are effective schools. Developing inclusive environments for students with special needs" (Department of Education and Training, 2006b). This paper recognised that it is the combination of certain beliefs, policies and practices that characterise inclusive schools and that this may mean "a substantial cultural shift" within a school. This paper stated:

> Beliefs and expectations may need to be challenged, teaching and learning policies and practices may need to be revised, learning spaces and

employment practices may need to be modified and roles and
responsibilities of staff may need to be redefined. (p. 8)

The characteristics of inclusive schools that this paper outlined included that learning tasks are targeted to the student's learning styles, interests, and needs and that schools forge strong links with parents and other supportive professionals (Department of Education and Training, 2006b, pp. 3-4).

Concerns about Inclusion

Teachers' Beliefs and Attitudes about Inclusion

Although there are now clear policies about inclusion, American, British, and Australian research has found that teachers' beliefs and attitudes about inclusion have been qualified or negative. In America, Myles and Simpson (1989) reported that 86% of classroom teachers surveyed were willing to accept a student with a disability if appropriate support and training were provided. Vaughn, Schumm, Jallad, Slusher, and Saumell (1996) found that a majority of the teachers interviewed experienced strong negative feelings about inclusion and felt that policies were out of touch with classroom realities. Many teachers also expressed feeling inadequately prepared to meet the needs of students with disabilities. Daane, Beirne-Smith, and Latham (2000) sought to identify the attitudes and beliefs that administrators and teachers had toward the inclusion of students with a disability. They found that administrators and teachers agreed to inclusion theoretically but experienced some insecurity and hesitancy to inclusive policies in practice. Teachers, in particular, expressed the need for more time to plan and collaborate with special education support teachers and for more ongoing professional development. Agran, Alper, and Wehmeyer (2002) found that teachers did not believe that access to mainstream education was appropriate for students with severe disabilities but believed that there was a need for various kinds of support provision for students with disabilities.

British research has found similar mixed findings in terms of teachers' attitudes, and has found that teachers' attitudes are often linked with the availability of support. Farrell (2004) stated that a key theme running through many studies is that "the success of inclusion depends to a great extent on the

availability and quality of the support that is offered in the mainstream school" (p. 10).

Australian research has also found similar mixed responses in regard to the attitudes of school administrators and teachers about inclusive policies and practices. In a review of Australian research, Forlin (2006) reported that although there was support for the policy of inclusion, teachers were concerned about their competence to implement this policy. He stated, "While there is strong support for the ideology of inclusion and political support for inclusive education, empirical evidence regarding the attitudes of teachers towards implementing such a policy is less convincing" (p. 269). He also reported that teachers were very reluctant to consider including students with high support needs or severe behavioural problems and that "acceptance clearly decreased as perceptions of the severity of the disability increased" (p. 270).

Training and Support of Teachers

Concern in Australia about the lack of training and support of teachers with regard to supporting students with a disability was raised in an Australian Senate report following a Senate committee's investigation of educational service provision for children with a disability. The committee inquired about the effectiveness of Commonwealth programs that were supporting the teaching of students with disabilities in Australian primary, secondary, and tertiary educational institutions. The committee sought submissions and direct input from many sources including school administrators, teachers, parents, and disability support groups.

The Employment Workplace Relations and Educational References Committee (2002) reported that they gained an understanding of the frustration and stress experienced by teachers. Teachers reported to the committee their concern about "a lack of training in the management and education of students with disabilities, a lack of time to prepare appropriate curricula, [and] a lack of funded support for affected children" (p. 2).

The committee also sought information from parents of children who had a disability about their relationship with their child's school. The committee

reported that in the process of reading and hearing submissions they gained a sense of the frustration and stress that parents often felt regarding the need to constantly advocate at school on behalf of their child (Employment Workplace Relations and Educational References Committee, 2002, p. 2). The committee noted "the large number of submissions it received from parents who claimed they had to bring teachers up to the mark on how to deal with children with various disabilities" (p. 45).

One of the key recommendations made in the report (Employment Workplace Relations and Educational References Committee, 2002) related to the need for trainee teachers and more experienced teachers to have increased training in relation to supporting students with a disability. It was stressed that there was a need for teachers to gain increased knowledge and understanding of disabilities and to learn more about methods for teaching a class of students with a wide range of abilities.

Particular Concerns in Relation to Students with an Autism Spectrum Disorder

As part of the general concern about the lack of training and support of teachers with regard to supporting students with a disability, there has been particular concern about the training and support that schools and teachers have received in including students with an ASD in mainstream schools.

In a British study by Helps, Newsom-Davis, and Callias (1999) it was found that many teachers felt inadequately trained and insufficiently supported when taking on the challenge of educating a student with an ASD. It was found that 70% of mainstream teachers reported having worked with a student with an ASD but only 5% reported having received specific training in their basic qualification course and 5% reported attending in-service training days (Helps et al., 1999, pp. 290-291). It was also found that this lack of training could lead to teachers tending to over-estimate the cognitive abilities of students and to not understand fully what it meant for a student to have a developmental disability. Helps et al. (1999) raised the possibility that this could lead to frustration on behalf of both teachers and students and could be linked with the development of disruptive behaviour in students. They concluded that many teachers lacked a

basic theoretical understanding of autism and that it was crucial that effective training schemes were established and that ongoing support was provided.

An American study by Spears, Tollefson, and Simpson (2001) sought to find out more about the knowledge base of rural and urban school psychologists. The psychologists were given a case scenario which included formal and informal data about a child with autism. It was found that the school psychologists had difficulty recognising autism and in distinguishing it from other disorders. Out of a choice of four possible diagnoses, the school psychologists ranked autism as one of the two least appropriate diagnoses and instead ranked a behavioural disorder as the most appropriate diagnosis.

The Australian Senate's Employment Workplace Relations and Educational References Committee (2002) reported that some teachers were particularly concerned about the "challenging and complex behaviours exhibited by some students, particularly those with autism" (p. 2). The committee's report included the following statement about the need for teacher training in relation to students with autism:

> The committee regards the lack of knowledge among educational professionals generally about the characteristics of autism as a matter of serious concern. Such ignorance adds to the difficulties faced by afflicted students in their grappling with school life and social adjustments, and adds greatly to the frustration of teachers and school administrators. Autism awareness should be addressed through relevant theoretical and practical components. (p. 57)

A report prepared by Kidman (2006) for the Victorian Department of Education and Training, Barwon South Western Region, included an examination of the professional development and future training needs of teachers and school support staff in relation to students with an ASD in this region. Kidman gathered qualitative data through a survey of the Department's schools in the region and through forums with principals and their representatives in every network across the region.

Precise figures of teachers across the region who had attended specific training in relation to ASDs were not recorded in Kidman's data. However, in the

compilation of responses obtained from the survey and the forums, it was indicated that although many teachers had attended professional training in understanding ASDs, there were also many who had not attended specific training (Kidman, 2006, p. 75). The training that teachers had attended consisted of seminar input that was relatively brief in nature and not intensive.

The responses also indicated that at least half of all of the teachers in every network across the region requested further training by specialists in relation to understanding and supporting students with an ASD. Teachers made particular mention of the need to understand more about the sensory issues of students with an ASD and more about managing the difficult behaviours of students with an ASD. Another common issue raised in the forums was the need for teachers to be able to access more support from a range of allied health professionals.

Kidman (2006) did not ascertain the knowledge base of school support staff in relation to ASDs. However, she recommended that further training in understanding and support of students with an ASD be made available to school support staff (p. 75).

Support for Schools and Teachers in Including Students with a Disability

Although there have been concerns about including students with a disability, there has also been significant support for schools and teachers in including students with a disability. A vital component of the Victorian Department of Education and Training's commitment to delivering an inclusive education system is its Program for Students with Disabilities (Department of Education and Training, 2006c). This program supports mainstream primary schools and the teachers in these schools in including students with a disability by providing additional funding to schools for these students.

If a school receives additional funding for a particular student through the Program for Students with Disabilities, the school is required to organise a Student Support Group (formerly called a Program Support Group) which includes the student's parent/guardian/carer(s) and the student's classroom teacher. This group generally meets three or four times a year. In these meetings learning goals are established for the student in an Individual Education Program

and decisions are made about how these goals will be implemented. The goals are regularly evaluated and new goals are set.

The additional funding which a school receives can be used to fund additional human resources, such as professional support or a teacher aide, or additional resource materials, but it is mostly used to fund a teacher aide. However, generally this additional human resource is only available to teachers for some of the school day. At the lowest level of funding, additional resource provision may only equate though to having a teacher aide for four hours per week. Within these limitations, the Program for Students with Disabilities facilitates a system of support that parents find helpful, and it provides human resources that teachers seem to find helpful.

With regard to students with a disability who are not eligible for additional funding through the Program for Students with Disabilities, a school may still support these students through the special needs support provided by the school. This may involve putting into place the same formal structure of support for these students as for those students who are eligible for additional funding through the Program for Students with Disabilities.

Nevertheless, there are problems with the ways in which schools and teachers are supported in including students with an ASD. One problem is that to be eligible for funding through the Program for Students with Disabilities as a student with an ASD, a student is required to have significant deficits in receptive and expressive language, significant deficits in adaptive behaviour, and a specified cut-off score on an autism rating scale (Department of Education and Training, 2006c, p. 45). However, the criteria also state that the student's language functioning should not be able to be accounted for by general intellectual disability. Therefore, if a student with an ASD has an intellectual disability, schools generally receive funding for the student under the Intellectual Disability criteria. Although this provides support for the student, it can also be limiting if the student's autism is not adequately recognised in the learning goals that are established for the student.

Another problem with the ways in which schools and teachers are supported when it comes to including students with an ASD is that some higher

functioning students, including students with Asperger's Disorder, are not supported by any formal structure of support. These students are often ineligible for funding through the Program for Students with Disabilities because they satisfy neither the ASD criteria nor the Intellectual Disability criteria. Frequently, the reason why these higher functioning students are not eligible on the basis of the ASD criteria is that both their receptive and expressive language abilities are not two standard deviations below the mean. Then, some of these higher functioning students who are ineligible for the Program for Students with Disabilities are also not supported by their school by the same formal structure of support as those students who are eligible for the Program for Students with Disabilities.

Kidman (2006) reported that school support psychologists and other school support staff were commonly concerned about unfunded students with an ASD who did not have a support structure within their school but who needed more intense behavioural intervention. Some school support staff expressed that they were aware of the need for teachers of these students to be supported, but they could not meet this need due to their large caseloads.

The Victorian Department of Humans Services, Barwon South Western Region, investigated the health and welfare of children with ASDs in this region. The resulting report (Department of Human Services, 2001) noted that children with an ASD who do not have an intellectual disability, including children with Asperger's Disorder, are frequently ineligible for funding under the Program for Students with a Disability. The report stated, "Limits on the assistance available for children with ASD leads to real difficulties for classroom teachers, and where the challenging behaviours become unmanageable, can result in temporary school exclusion for these children" (p. 20). In response to these school issues the report made a recommendation in regard to setting up an Autism Support Service that could provide specialists in the field of ASDs to train and to work alongside classroom teachers and teacher-aides (p. 21). This recommendation has not yet been followed through.

Concern about a lack of support for students with Asperger's Disorder has also been expressed with regard to the whole of Australia. Prior (2003c) makes

the point that in Australia there is a "general tendency for services to be either unavailable or insufficient for children and young people with a diagnosis of Asperger Syndrome" (p. 308).

In recent years there has been a growing recognition from within the Department of Education and Training that students with Asperger's Disorder have marked deficits in pragmatic language that are not measured in the current language testing requirements. Some applications for funding through the Program for Students with Disabilities which have been made by professionals on the basis of severe pragmatic language deficits have been successful. However, it remains difficult to obtain additional funding support for these higher functioning students and ineligibility continues to be a reality. Reforms to the eligibility criteria for the Program for Students with Disabilities are due to be made by the Department of Education and Training at some time in the future, but there is no guarantee that this will increase the likelihood of students at the higher end of the autism spectrum more frequently receiving funding support. The current reality is that across mainstream schools there are a considerable number of students who have a diagnosis of an ASD but who are not deemed eligible for additional support through the Program for Students with Disabilities.

Personal Observations and Concerns

The writer became aware of a need for mainstream primary schools and the teachers in these schools to be more effectively supported in including students with an ASD through working as an educational psychologist for the Victorian Department of Education and Training (now the Department of Education and Early Childhood Development). The writer worked for six years in the eleven schools (Primary, Secondary and Preparatory to Year 12 schools) in the Corangamite District of the Barwon South Western Region. During this time, she endeavoured to support schools, individual teachers, students, and parents. She also undertook further study and research in special education in order to become more proficient in supporting students with disabilities.

The writer observed that when students with an ASD did not have any formal structure of support, they still received some support. Teachers

accommodated for the needs of such students as well as they could. Their support interventions were most commonly verbal prompts but rarely environmental and curricular modifications. Teachers seemed to manage well enough in these ways if they were very structured in their teaching, if the range of difficulties experienced by the student was not too marked, and if the student's overall temperament and presentation was relatively passive. Some students with an ASD who were higher functioning had great difficulty concentrating, some struggled markedly with some academic areas, and some demonstrated concerning behaviours. Sometimes their behaviours at school could escalate, either becoming more aggressive or disruptive or becoming more withdrawn or depressed. Sometimes they refused to go to school or they exhibited behavioural changes at home that caused parents to contact the school. In cases such as these, and especially if the student's behavioural difficulties escalated, further help from the writer as the psychologist allocated to the school tended to be sought. The writer would then recommend that proactive system support be put in place and that certain strategies be tried, but the writer was concerned that there was often no regular planning and support for these higher functioning students with autism before their academic difficulties became more marked or their behavioural difficulties escalated.

The writer also observed that even when students with an ASD were supported by a formal structure, the support provided could be relatively narrowly based. Students with an ASD have considerable deficits in social, emotional, and academic domains that are evident throughout their schooling years and beyond, but the Individual Education Program goals were mostly formulated in relation to academic areas. They were less commonly formulated in relation to environmental and structural supports for the student in the classroom or in the playground and also less commonly in relation to curriculum to encourage the student's social or emotional learning. School staff seemed to lack knowledge about the importance of a range of supportive interventions across multiple domains of student functioning.

In the course of the writer's daily work, she was often in the position of making or following up a diagnosis in relation to a student with an ASD and providing recommendations about how the student might be more successfully

included in the classroom and playground. Typically, the writer would make these recommendations in a report which she would discuss with the classroom teacher, the staff member responsible for special education, and the parent. The report would explain the cognitive and academic profile of the student and outline reasons for the current difficulties that the student was experiencing. The report would also include a number of recommendations about inclusive educational practices. One of these recommendations would be that there should be regular contact between teachers and parents. Another recommendation might be that the student should be helped to know what was happening throughout a day and what was expected in particular tasks. Other recommendations would be made about a range of academic, social, and emotional supports. However, over time it became apparent to the writer that generally effective schools and generally capable teachers were quite often struggling to actually implement such recommendations. It seemed to the writer that teachers tended to have insufficient knowledge of practices considered effective in working with students with an ASD and could also have difficulty in implementing recommended strategies even if they were aware of them. This was due to a multiplicity of factors – perhaps lack of time, lack of resources, or even not really believing that a strategy would actually work.

Models of Support for Inclusion

Given that there have been problems with the ways in which schools and teachers have been supported in including students with an ASD, the writer considered that there was a need for a model of how schools and teachers might be successfully supported in including students with an ASD. The model needed to help teachers gain more knowledge about ASDs in order for them to better understand the cognitive difficulties of students with an ASD and the range of areas these students need support in. The model also needed to help teachers gain more knowledge in relation to best-practice interventions and to support teachers in trialling interventions that make sense to them and that they are willing to embrace. All this was necessary not only so that teachers would be able to prevent behavioural problems from arising but also so that teachers would be able to

facilitate the best opportunity for students with an ASD to learn and to benefit from both the classroom and social interactions in the playground.

This writer found two models in the literature that were very helpful. The models overlapped in many features and other aspects of the two models were complementary. One model was suggested by Kunce (2003). She called this model the "Integrative Model of Effective Education Intervention". The other model was suggested by Simpson, de Boer-Ott, and Myles (2003). They called this model the "Autism Spectrum Disorder Inclusion Collaboration Model".

Kunce's model was particularly helpful in that it set out a sequential framework of the various elements of support that a student with an ASD requires. Her model clearly outlined foundational, structural, and curricular elements and explained how each element builds on the next element. Her model also outlined in considerable detail specific educational interventions, both structural and curricular interventions, across a range of domains of functioning. Kunce's model primarily utilised the structured teaching practices promoted by the Treatment and Education of Autism and related Communication handicapped CHildren (TEACCH) program (developed by Eric Schopler and his colleagues in the 1960's) which emphasised the need to change the classroom environment to support the student's learning. The writer thought that Kunce's model was particularly helpful in its clarity and in the guidance it gave about particular interventions that were considered to have a good evidence base, and in the clear emphasis on considering structural elements prior to curricular elements.

Simpson and colleagues' model emphasised equitable, collaborative problem solving relationships between all parties involved educationally with a student, namely, the teacher, the parents, and others involved in supporting the student's education, such as teacher aides and school support professionals. Given the problem which the writer had observed of teachers having difficulty implementing recommendations, the writer thought that involving teachers in equitable, collaborative problem solving relationships with parents and others involved in supporting the student's education might well be very important. It was thought that collaboration would be important in ensuring that suggested strategies were not imposed on teachers but, rather, embraced by teachers.

Collaboration could also mean that teachers could be supported in the implementation of these interventions.

It is also important to note that Kunce's model and Simpson and colleagues' model both stated that the model needs to be applied individually to individual students, given that each student with an ASD presents with his or her own unique strengths and needs across multiple domains.

In the present research the writer has developed her own model of how schools and teachers might be supported in including students with an ASD. This model is Kunce's model with some significant additional features and other minor changes. The most significant additional feature is that there should be collaboration between the teacher, the parents, and others involved in supporting the student's education. As already mentioned, this was the central feature of Simpson and colleagues' model. Kunce's model emphasised the need for a collaborative relationship between the teacher and the parents, but Simpson and colleagues' model emphasised the need for a collaborative relationship between the teacher and others involved in supporting the student, as well as between the teacher and the parents.

Having developed this model of support, the writer has sought to establish whether support for mainstream primary schools and teachers in the framework of this model is of benefit in including students with an ASD. She has done this by implementing this model with a number of students with an ASD and then evaluating whether this was of benefit. Specifically, she has sought to establish if the support involved in the implementation of this model was of benefit to the students in terms of behavioural change, and she has also sought to establish whether it was of benefit to the teachers and parents of these students.

With regard to each student involved in this research, a layer of whole school support was put in place and a group consisting of the teacher, teacher aide (if allocated), and parents of the student worked in a collaborative way with the writer as an autism consultant for an ongoing period of four months. Over this period of time issues raised by teachers and parents, as well as concerns evident in assessment findings, were worked on one by one utilising collaborative problem solving. Kunce's emphasis on looking for structural solutions and then curriculum

solutions provided a guide for how to work on each problem, but the group also worked collaboratively in deciding upon the specific educational plan for the student. As well, the group worked out together how the student's teacher could be supported in what was decided upon.

In order to maintain support for each student involved in this research, it was also ensured that a Student Support Group which could continue after the research period had ended was established for each student, regardless of their eligibility for the Program for Students with Disabilities.

CHAPTER 2
THE DESCRIPTION AND PREVALENCE OF
AUTISM SPECTRUM DISORDERS

In the preceding chapter, it was explained that the present research involved implementing a model of support for schools and teachers to include students with an Autism Spectrum Disorder. In this chapter the development of the use of the term "Autism Spectrum Disorders" and the diagnostic categories considered to be part of this spectrum will be discussed.

The Description of Autistic Disorder

In 1943 Kanner described the psychological features of 11 children (8 boys and 3 girls). He concluded that these children had a number of "essential common characteristics" which formed a previously unreported "syndrome" (Kanner, 1943/1973, p. 33).

The central characteristic that Kanner (1943/1973) identified was that these children had an "inability to relate themselves in the ordinary way to people and situations from the beginning of life." He also described this central characteristic as "an extreme autistic aloneness" (p. 33). One way that these children expressed this was in the failure of "almost all" of them as infants "to assume at any time an anticipatory posture preparatory to being picked up" (p. 34).

Another essential characteristic that Kanner (1943/1973) identified was that that these children had difficulty with language. He found that their language ability could vary from being mute or echolalic to having some language ability. However, even when they had acquired some language ability, they did not use it for two-way communication. They often had difficulty attending to language and their understanding of language could be very literal and inflexible (pp. 34-35).

Yet another essential characteristic that Kanner (1943/1973) identified was that these children had "an anxiously obsessive desire for the maintenance of sameness" (p. 36). This was demonstrated in their resistance to change and their

preference for repetitive activities. Related to this, these children had a fascination for objects and a preference for objects over people, which was one of the reasons for their limited ability for normal pretend play. However, anything that changed their external environment, such as loud noises, or anything which changed their internal environment, such as food, represented an "intrusion" which was feared or refused (pp. 38-39).

With regard to these children's physical abilities, Kanner (1943/1973) mentioned that stereotypical movements of limbs and body were common among these children and that "several of the children were somewhat clumsy in gait and gross motor coordination, but all were very skilful in terms of finer muscle coordination" (p. 40).

With regard to these children's intellectual ability, Kanner (1943/1973) originally described them as being "endowed with good cognitive potentialities" despite their being looked upon as intellectually impaired (p. 39). However, in a follow-up report, Kanner (1973) reported on the subsequent histories of the children in his original work. He found that only two of these children went on to have employment. He recognised that the histories of the children might have been different with different support and that he could not ascertain all of the reasons for the differences in their subsequent histories but he wondered whether or not the condition might present with varying degrees of severity.

During the 1970's a consensus on the validity of "infantile" or "childhood autism" as a diagnostic category emerged. Rutter (1978) synthesised Kanner's original descriptions from 1943 with subsequent research into an influential definition of autism. Although Kanner (1973) expressed that he did not know the precise reason for differences in severity, Rutter recognised that one of the factors affecting the severity of presentation of autism was intellectual ability and that autism and intellectual disability could coexist. This meant that in diagnosing autism it was important to clarify that the child's impaired social development and unusual language were out of keeping with his or her intellectual ability. Rutter's definition specified "impaired social development", "delayed and deviant language development", and "stereotyped play patterns, abnormal preoccupations,

[and] resistance to change" (Rutter, 1978, p. 19). As well, these impairments were to be evident by two and a half years of age.

Official definitions of "childhood autism" were adopted in the World Health Organisation's *International Classification of Diseases*, ninth edition (ICD-9) published in 1978 and in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, third edition (DSM-III) published in 1980. Wing (1997) details how the definition of autism has been revised in these classification systems over time, but the current diagnostic criteria in DSM-IV-TR (American Psychiatric Association, 2000) and ICD-10 (World Health Organization, 1993) remain based on the fundamental areas of deficit identified by Kanner in 1943. In the DSM-IV-TR the specific diagnostic term used is "Autistic Disorder" and in the ICD-10 the diagnostic term used is "Childhood Autism". The diagnostic criteria in DSM-IV-TR are (1) "qualitative impairment in social interaction", (2) "qualitative impairment in communication", and (3) "restricted repetitive and stereotyped patterns of behavior, interests, and activities", with "onset prior to age 3 years" (p. 75). The diagnostic criteria in ICD-10 are almost identical.

The Description of Asperger's Disorder

In 1944, a year after Kanner's original paper, Asperger (1944/1991) described four children (all boys) whom he independently defined as being "autistic". He observed in these children a range of symptoms. He noted social difficulties, such as being socially odd or naïve, and egocentricity. In relation to verbal communication he noted that these children had good vocabulary and grammar and fluent speech. However, he also noted that they could be long-winded, literal, and pedantic, that they could have a peculiar tone of voice, and that they had poor non-verbal communication. He also described these children's circumscribed interest in specific subjects and their stereotyped play. As well, he observed that these children had odd responses to sensory stimuli and poor motor coordination. He also found that these children had intelligence in the borderline, normal, or superior range but had difficulty in learning conventional school work.

The key difference between the children Asperger (1944/1991) described and the children Kanner (1943/1973) described was that they were not as impaired as the children Kanner described. Asperger noted that the children which he described had the language ability to express unusual thoughts and perceptions and had all developed speech before school age. Asperger's opinion in relation to the intellectual ability of these children seemed to change somewhat over time. In his original paper Asperger said that the children he was describing had different levels of ability and that this could include intellectual disability (Asperger, 1944/1991, pp. 74-75). However, when writing later Asperger (1979) emphasised that these children had well-developed intelligence and special abilities in the areas of logic and abstraction.

One of Asperger's greatest legacies is that he admired these children's independent thinking. He also believed that although these children were difficult to manage and could have learning difficulties, it was possible to support them, so long as they received appropriate educational guidance from a "dedicated and loving educator" (Asperger, 1944/1991, p. 90).

Little attention was paid to Asperger's original paper until Wing (1981) brought it into greater public awareness thirty-seven years later. She referred to Asperger's descriptions of his subjects and also discussed thirty-four of her own subjects (28 boys and 6 girls) in order to describe a syndrome which she referred to as "Asperger syndrome".

The term "Asperger's Syndrome" appeared in the *International Classification of Diseases* for the first time in 1990 in a draft of the tenth edition and then when this edition was published in 1993 (ICD-10; World Health Organization, 1993). The term "Asperger's Disorder" appeared for the first time in the *Diagnostic and Statistical Manual of Mental Disorders* in 1994 in the fourth edition (DSM-IV; American Psychiatric Association, 1994). The diagnostic criteria in DSM-IV-TR (American Psychiatric Association, 2000) include the criteria, "qualitative impairment in social interaction" and "restricted repetitive and stereotyped patterns of behavior, interests, and activities" (p.84). These criteria are also included in the criteria for Autistic Disorder. However, the criteria for Asperger's Disorder do not include the criterion, "qualitative impairment in

communication". Rather, the criterion for Asperger's Disorder is that "there is no clinically significant general delay in language". In addition, the criteria for Asperger's Disorder include that "there is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behaviour (other than in social interaction), and curiosity about the environment in childhood" (p. 84). The diagnostic criteria in the ICD-10 are almost identical in terms of requirements and exclusionary criteria.

Problems with the Current Diagnostic Criteria

One problem with the current diagnostic criteria is in relation to communication. The criteria in DSM-IV-TR and ICD-10 for Asperger's Disorder/Syndrome require that there are no signs of early language delay (e.g., single words used by two years of age and communicative phrases by three years of age). However, for some children with marked early language delay who have been diagnosed with Autistic Disorder/Childhood Autism, language can develop later (typically between the ages of four and ten years). Subsequent developmental progress will be very different for the child who develops fluent language and the child who has little or no language. The children who have marked early language delay but who go on to develop language can change with age until they resemble children who have been diagnosed with Asperger's Disorder/Syndrome. These cases have led to discussion regarding whether or not Asperger's Disorder/Syndrome should be considered a separate and distinct diagnostic category to Autistic Disorder/Childhood Autism (Frith, 1991; Wing, 1981; Wing, 1991; Wing, 1998).

Some professionals have used the term Asperger's Disorder/Syndrome for these children who have early language delay but who develop language later. In using this term for these children, these professionals have disregarded the exclusionary diagnostic criterion concerning no early language delay in the diagnosis of Asperger's Disorder/Syndrome (Eisenmajer et al., 1996). Other professionals have used the term High Functioning Autism for these children on the basis that these children fit the diagnostic criteria for Autistic Disorder/Childhood Autism in terms of having qualitative impairment in

communication language prior to age 3 years. It has been suggested that the term High Functioning Autism should be used for children who satisfy the criteria for Autistic Disorder/Childhood Autism but who develop language later and who have overall intellectual ability above 65 to 70 on a standardised test (Gillberg & Ehlers, 1998).

Those who argue for the distinction between Asperger's Disorder/Syndrome and High Functioning Autism say that children with High Functioning Autism present differently to those who have Asperger's Disorder/Syndrome, in that they are less likely to be socially interested and are less likely to have special interests (Mesibov, Shea, & Adams, 2001). In addition, some say they are likely to be less clumsy than those with Asperger's Disorder/Syndrome (Gillberg & Ehlers, 1998). However, others assert that there is no greater evidence of motor clumsiness in those with Asperger's Disorder/Syndrome compared to those with High Functioning Autism (Manjiviona & Prior, 1995). It seems to the writer that the key question is whether or not early language delay has long term significance when there is good progression in language skills over the course of the child's development, and this question has not yet been resolved.

Another problem with the current diagnostic criteria is in relation to self-help skills and adaptive behaviour. The criteria in DSM-IV-TR for Asperger's Disorder include that there is to be "no clinically significant delay…in the development of age-appropriate self-help skills, [and] adaptive behavior (other than in social interaction)" (American Psychiatric Association, 2000, p.84). The corresponding ICD-10 criterion is worded slightly differently and says that "self-help skills, [and] adaptive behaviour…during the first three years should be at a level consistent with normal intellectual development" (World Health Organization, 1993, p. 186). However, Asperger (1944/1991) recognised that the children he observed had poor daily living skills. Leekam, Libby, Wing, Gould, and Gillberg (2000) also ascertained that the inclusion of normal adaptive skills as a criterion for Asperger's Disorder/Syndrome was a problem with the current classification systems criteria. In addition, clinicians frequently report that children satisfying a diagnosis of Asperger's Disorder/Syndrome in every other

respect often have difficulty with self-help and daily living skills. As well, treatment and support suggestions for children with Asperger's Disorder/Syndrome frequently include assistance in developing adaptive skills (Klin & Volkmar, 2000). The issue of whether or not to include the condition of "no clinically significant delay" in adaptive behaviour skills in the criteria for Asperger's Disorder/Syndrome also remains unresolved.

Autism as a Spectrum

Although Wing (1981) brought greater awareness to what she referred to as "Asperger syndrome", she had not intended that Asperger syndrome should be defined as a separate and distinct diagnostic category to Autistic Disorder/Childhood Autism. On the contrary, she had intended to emphasise the possibility of Asperger syndrome as a subcategory of autism (Wing, 2000).

Wing and Gould (1979) carried out research with children who had one or more of the three core areas of impairments described in the diagnostic criteria for Autistic Disorder/Childhood Autism and who had a range of intellectual ability. Wing referred to the impairments described in the diagnostic criteria for Autistic Disorder/Childhood Autism as a "triad" of impairments. When Wing (1991) described the results of the 1979 research, she wrote that "each of [the triad of impairments] was manifested in different ways in different children" (p. 109). The 1979 research and Wing's clinical work led her to the conclusions that there is "a continuum of impairments of the development of social interaction, communication and imagination and consequent rigid, repetitive behaviours" (Wing, 1991, p.111) and that Autistic Disorder/Childhood Autism and Asperger's Disorder/Syndrome fall within this continuum but that they form only a part of this continuum.

Wing's idea of autism being a continuum or spectrum is helpful in that it takes account of the diagnostic complexities and the reality that each of the triad of impairments varies significantly in different individuals. The diagnostic systems (DSM-IV-TR and ICD-10) are systems that are based on the idea of an impairment being present or not, whereas Wing's idea allows for varying degrees of impairment within each of the triad of impairments. The term "Autistic

Spectrum Disorders" was suggested by Wing in 1996 to describe the hypothesis of a continuum or spectrum of autistic disorders (Wing, 1996).

The triad of impairments were seen by Wing as the core areas of impairment. Impairment in social interaction could range from being aloof or indifferent to others to being active in approaching others but doing so in an odd way that tends to be one-sided. Impairment in communication was seen as distinct from impairment in formal language and was understood to vary from an absence of attempts to communicate, to repetitive monologues regardless of the listener's response. Rigid, repetitive patterns of behaviour could range from body movements, such as rocking, to absorption in specific interests. It may also be noted that Wing's idea of a continuum of communication impairment provides an alternative way of resolving the problem of distinguishing the diagnostic criteria for Autistic Disorder/Childhood Autism and Asperger's Disorder/Syndrome on the basis of when formal language develops. Wing views all people on the spectrum of autistic disorders as having impairment in communication but she describes this impairment as varying from absent or delayed language to language that has more subtle communication deficits.

Although Wing (1991) saw the triad of impairments as the core areas of impairment, she also believed that other variables were involved in the whole clinical picture of an individual presenting with an Autistic Spectrum Disorder. She included in her clinical variables different levels of formal language ability, varying non-verbal language ability, a range of sensory differences, and a range of motor movement differences. Other variables could also be included, such as visuo-spatial skills, gross and fine motor co-ordination, reading, writing, calculation/mathematical skills, and adaptive skills. She also stated that there may be any level of overall intelligence (Wing, 1991).

The autistic continuum across multiple domains is described in Table 2.1 which reproduces a table by Wing (1991). This table includes descriptions of a range of features within each domain most often used in diagnosis.

One potential problem with the idea of a continuum of autistic disorders is that it may be thought that features seen in those with less intellectual impairment have less impact than features seen in those with more intellectual impairment.

Table 2.1

The Autistic Continuum (Features Most Often used in Diagnosis[a])

Item	Manifestations[b]			
	1 Tend to be seen in the most severely impaired[c]	**2**	**3**	**4 Tend to be seen in the least severely impaired[c]**
a. Social interaction	Aloof and indifferent	Approaches for physical needs only	Passively accepts approaches	Makes bizarre one-sided approaches
b. Social communication (verbal and non-verbal)	No communication	Needs only	Replies if approached	Spontaneous, but repetitive, one-sided, odd
c. Social imagination	No imagination	Copies others mechanically	Uses dolls, toys correctly but limited, uncreative, repetitive	Acts out one theme (e.g. Batman) repetitively, may use other children as "mechanical aids"
d. Repetitive pattern of self-chosen activities	Simple, bodily directed (e.g. face tapping, self-injury)	Simple, object directed (e.g. taps, spins, switches lights)	Complex routines, manipulation of objects, or movements (e.g. bedtime ritual, lining up objects, attachment to objects, whole-body movements)	Verbal, abstract (e.g. timetables, movement of planets, repetitive questioning)
e. Language – formal system	No language	Limited – mostly echolalic	Incorrect use of pronouns, prepositions; idiosyncratic use of words/phrase; odd constructions	Grammatical but long winded, repetitive, literal interpretations
f. Responses to sensory stimuli (oversensitive to sound, fascinated by lights, touches, tastes, self-spinning; smells objects or people; indifferent to pain, cold, etc.)	Very marked	Marked	Occasional	Minimal or absent
g. Movements (flaps, jumps, rocks, tiptoe-walking, odd hand postures, etc.)	Very marked	Marked	Occasional	Minimal or absent
h. Special skills (manipulation of mechanical objects, music, drawing, mathematics, rote memory, constructional skills, etc.)	No special skills	One skill better than others but all below chronological age	One skill around chronological age – rest well below	One skill at high level, well above chronological age, very different from other abilities

[*Note*. From "The Relationship between Asperger's Syndrome and Kanner's Autism," by L. Wing. In *Autism and Asperger Syndrome* (pp. 112-113), ed. U. Frith, 1991, Cambridge: Cambridge University Press.]

[a] [Note by Wing:] There are other clinical features seen in disorders in the autistic continuum, but they are not mentioned in the various sets of criteria considered essential for diagnosis.

[b] [Note by Wing:] The manifestations of each item (numbered 1 to 4 under each heading) are arbitrarily chosen points along a continuum. In reality, each shades into the next without any clear divisions.

[c] The words "handicapped/retarded" that Wing used have been changed to "impaired".]

This is not the case. The overall impact of an Autistic Spectrum Disorder on a person's life may be marked whatever the level of intelligence.

Terms Used in This Thesis

There is some confusion in relation to the precise words used to describe the hypothesis of a spectrum of autistic disorders. The initial term used by Wing (1996) was "*Autistic* Spectrum Disorders" but this has generally changed in common usage to "*Autism* Spectrum Disorders" and this is the term which is generally used in this thesis. Another confusion is in relation to whether there are a number of Autism Spectrum Disorders or whether there is one Autism Spectrum Disorder. The former position suggests that Autistic Disorder/ Childhood Autism, Asperger's Disorder/Syndrome, and one or more other conditions may be considered to be Autism Spectrum Disorders. The latter position may suggest that Autism Spectrum Disorder is another condition like Autistic Disorder/Childhood Autism and Asperger's Disorder/Syndrome. In this thesis the term *Autism Spectrum Disorders* is understood to be an umbrella term that covers a number of different conditions. However, it is understood that these conditions are not always able to be neatly classified according to DSM-IV-TR or ICD-10 criteria. Rather, the term *Autism Spectrum Disorders* is understood to include some conditions such as Autistic Disorder/Childhood Autism and Asperger's Disorder/Syndrome which can be classified according to DSM-IV-TR or ICD-10 and some conditions which cannot be classified easily but which show impairment that is on the continuum of impairment in each of the three core areas of impairment.

In DSM-IV-TR (American Psychiatric Association, 2000) and ICD-10 (World Health Organization, 1993), the following conditions are listed under the general term Pervasive Developmental Disorders:

- Autistic Disorder (DSM-IV-TR) or Childhood Autism (ICD-10)
- Atypical Autism (ICD-10 and included in Pervasive Developmental Disorder Not Otherwise Specified in DSM-IV-TR)
- Rett's Disorder (DSM-IV-TR and ICD-10)
- Childhood Disintegrative Disorder (DSM-IV-TR and ICD-10)

- Overactive Disorder Associated With Mental Retardation and Stereotyped Movements (ICD-10)
- Asperger's Disorder (DSM-IV-TR) or Asperger's Syndrome (ICD-10)
- Pervasive Developmental Disorder Not Otherwise Specified (including Atypical Autism in DSM-IV-TR but not including Atypical Autism in ICD-10)

Pervasive Developmental Disorder Not Otherwise Specified/Atypical Autism is a diagnostic category that can be used when a person demonstrates severe impairment in social interaction but has atypical or sub-threshold symptomology for a diagnosis of Autistic Disorder/Childhood Autism or Asperger's Disorder/Syndrome.

In this thesis the general term *Autism Spectrum Disorders* is understood to include Autistic Disorder/Childhood Autism, Asperger's Disorder/Syndrome, and Pervasive Developmental Disorder Not Otherwise Specified/Atypical Autism, but not Rett's Disorder, Childhood Disintegrative Disorder, or Overactive Disorder Associated With Mental Retardation and Stereotyped Movements. The reason for not including these conditions is that Rett's Disorder has some very specific characteristic features and is reported mainly in females, Childhood Disintegrative Disorder has a distinctive pattern of severe deterioration in multiple areas of functioning (DSM-IV-TR, 2000, p. 74), and Overactive Disorder Associated With Mental Retardation and Stereotyped Movements is only listed in ICD-10 and does not require social impairment to be present for its diagnosis.

As mentioned previously, some professionals have used the term *High Functioning Autism* to refer to children diagnosed with Autistic Disorder/ Childhood Autism who develop language later and who have an overall intellectual ability above 65-70 on a standardised test. In this thesis such children are simply described as having Autistic Disorder/Childhood Autism or, more generally, as having an Autism Spectrum Disorder.

In this thesis the DSM-IV-TR term *Autistic Disorder*, rather than the ICD-10 term *Childhood Autism*, is generally used, the DSM-IV-TR term *Asperger's Disorder*, rather than the ICD-10 term *Asperger's Syndrome* is generally used, and the term *Autism Spectrum Disorder Not Otherwise Specified*, rather than

either the DSM-IV-TR term *Pervasive Developmental Disorder Not Otherwise Specified* or the ICD-10 term *Atypical Autism*, is generally used. Autism Spectrum Disorders will generally be referred to using the acronym ASDs and an Autism Spectrum Disorder will generally be referred to as an ASD.

Prevalence of Autism Spectrum Disorders

International Prevalence Studies

The earliest prevalence study of autism was conducted by Lotter in 1966. He applied Kanner's (1943/1973) criteria and found prevalence rates of 4-5 per 10,000 (Bryson, 1997; Lotter, 1966). Fombonne (2003) considered prevalence studies published since 1987 using various diagnostic criteria. He derived a conservative estimate for all Pervasive Developmental Disorder's of 27.5 per 10,000 (i.e., 10/10,000 for Autistic Disorder, 15/10,000 for Pervasive Developmental Disorder-Not Otherwise Specified, and 2.5/10,000 for Asperger's Disorder). He noted that 3 recent surveys yielded rates for all Pervasive Developmental Disorder's of about 60 per 10,000 (Fombonne, 2003, p. 373). Others have found higher prevalence rates with regard to Asperger's Disorder than indicated by Fombonne. Gillberg (2002) estimated that about 30-40 children in every 10,000 develop the full clinical picture of Asperger's Disorder.

The sex ratios seem to vary according to severity of ASDs. Estimates for Autistic Disorder are that males outnumber females by 3:1 (Happé & Frith, 1996; Hill & Frith, 2003). Estimates for the male-female ratio for Asperger's Disorder vary widely. Hill and Frith (2003) reported estimates varying from 4:1 to 10:1 and Gillberg (2002) estimated possibly 3:1 to 6:1 at the more able end of the spectrum. Attwood (2006) believes that there is a need for further epidemiological studies to establish the true incidence of girls with Asperger's Disorder. It is possible that females at the higher end of the spectrum are under-diagnosed given that the characteristic features of an ASD may be more subtly presented in females at this end of the spectrum.

Australian Prevalence Studies

There have not been many formal prevalence studies of ASDs in Australia. In one study conducted in the Barwon region of Victoria in 2002 by Icasiano, Hewson, Machet, Cooper, and Marshall (2004) a prevalence rate of 39.2 per 10,000 for all ASDs was found. The formal diagnoses given were: 50.8% Autistic Disorder, 26.6% Asperger's Disorder, 5.6% Pervasive Developmental Disorder-Not Otherwise Specified, and 16.9% Autism Spectrum Disorder. The male-female ratio was found to be 8.3:1 and the age of diagnosis ranged from 2.3 years to 16.3 years. The total prevalence figure was also found to represent a ten-fold increase in the rate of diagnosis of ASDs in the Barwon region over the past 16 years.

Concern about an increasing prevalence of ASDs in Australia has recently led to the Australian Advisory Board on Autism Spectrum Disorders commissioning a report on prevalence. The report (MacDermott, Williams, Ridley, Glasson, & Wray, 2006) found that the most reliable source of data was a national data base (Centrelink). The estimated prevalence of ASDs across Australia for 6-12 year old children in 2005 was found to be 62.5 per 10,000 (47.2 per 10,000 for Autistic Disorder and 15.3 per 10,000 for Asperger's Disorder). The prevalence of 62.5 per 10,000 (1:160) for ASDs is very similar to the estimated prevalence reported in three recent surveys by Baird et al. in 2000, Bertrand et al. in 2001, and Chakrabarti and Fombonne in 2001, which were referred to by Fombonne (2003).

The report by (MacDermott et al., 2006) also found that the male to female ratio for Autistic Disorder was 5.2:1, the male to female ratio for Asperger's Disorder was 6.5:1, and the male to female ratio for the total of both disorders was 5.5:1.

Reasons for Increase in Prevalence

There is debate about the reason for the increase in estimated prevalence in Australia and overseas. The current opinion is that this is due to a mix of reasons that do not necessarily reflect an actual increase in prevalence (Prior, 2003a). These reasons include (1) changes in diagnostic criteria in the studies, (2) a heightened awareness of ASDs among professionals resulting in earlier diagnosis

and better identification, (3) increasing public awareness through the media, and (4) an increasing desire in the community for supporting people with a disability regardless of their level of intellectual functioning (Employment Workplace Relations and Educational References Committee, 2002; Icasiano et al., 2004; MacDermott et al., 2006). Whatever the reason for the increase in estimated prevalence, current estimates of prevalence suggest that autism can no longer be thought of as a rare disorder.

CHAPTER 3

DEFICITS IN FUNCTIONING ASSOCIATED WITH AUTISM

SPECTRUM DISORDERS AND IMPLICATIONS FOR EDUCATION

Understanding more about ASDs and the primary deficits in functioning associated with these disorders is the first step in understanding students who present with these disorders.

The Cause of Autism Spectrum Disorders

Since the work by Kanner (1943/1973) and Asperger (1944/1991), many attempts to explain ASDs have been made and these explanations have had implications for interventions. During and after the Second World War psychoanalysis was becoming influential and in Kanner's original work (1949) his suggestion that the lack of emotional reciprocity of a child with autism may be due to lack of emotional warmth in their parents was taken up uncritically by some (Bettelheim, 1967). Interventions based on Bettelheim's theory led to distressing outcomes for parents. However, by the 1970's new research and especially Rutter's (1978) work emphasised that autism does not have a psycho-social cause but rather that particular cognitive and linguistic deficits are primary features of autism. It has now "become accepted that [autism] is a neuro-developmental disorder in which specific cognitive deficits play a key role, and for which genetic factors predominate in aetiology" (Bailey, Phillips, & Rutter, 1996). Intervention based on this theory assumes that these neuro-developmental deficits need to be supported.

With regard to the evidence that ASDs are neurological disorders, some studies point to structural differences in the autistic brain. The most consistent finding that has emerged is that the autistic brain is on average larger and heavier than the brain of control subjects from two to four years of age but not from birth (Courchesne et al., 2001). This increased brain size is suggestive of early brain overgrowth. In the early development of normally developing infants there is a proliferation of growth in axons and synaptic contacts. Hill and Frith (2003)

suggest that the early brain overgrowth might be due to a lack of pruning and that this might lead to poor functioning in certain neural circuits.

The precise brain systems affected are not yet well established, but Magnetic Resonance Imaging has shown that there are differences in the way people with an ASD process some information. Shultz et al. (2000) looked at the parts of the brain that were used to process information about faces and objects. They found that the part of the brain that subjects with an ASD used to distinguish faces was the part of the brain that normal controls used to distinguish objects. This research clearly indicated that there are functional differences in the way in which people with an ASD neurologically process certain socially related information.

There is, then, evidence that ASDs are neurological disorders. The question arises whether these neurological disorders are caused by something that damages the brain before birth, during birth, or after birth. Most researchers agree that there may be a variety of causes for autism and that complications during pregnancy or birth and environmental factors may interact with genetic susceptibility (Happé & Frith, 1996; Rutter, 1997). Twin studies provide strong evidence that genetic factors are involved. Hill and Frith (2003) refer to Bailey et al.'s (1995) finding that if a wide definition of autism is used, in 90% of cases when one monozygotic twin has the disorder, the other one has also (Hill & Frith, 2003, p. 282).

Psychological Theories to Explain Autism Spectrum Disorders

Three different psychological theories have been proposed to explain the particular cognitive difficulties of an individual with an ASD. These three theories are that an individual with an ASD has (a) a *theory of mind* deficit, (b) an *executive functioning* deficit, and (c) weak *central coherence*. Hill and Frith (2003) suggest that these theories are not necessarily mutually exclusive theories (p. 289).

Theory of Mind Deficit

The term *theory of mind* has been defined as referring to one's ability to be able to think about what others are thinking and to interpret another's belief, desire, intention, or emotion, that is, to attribute mental states to others which are independent of one's own mental states. However, it is suggested by Bartak, Bottroff, and Zeitz (2006) that theory of mind should be understood as involving more than "knowing that other people have feelings, thoughts, and motives." They suggest that theory of mind should be understood as also involving "receptive skills to decode facial expressions, body language, social contexts, and tone of voice", "knowing what others feel, think, and desire", "knowing what one feels, thinks, or wants", "receptive skills to decode one's own facial expression, body language, or tone of voice", and "knowing the effect of one's own behaviour on others" (Bartak et al., 2006). If theory of mind is defined in this extended way, the complexity of theory of mind ability can be better understood.

Having a theory of mind deficit means that one has difficulty understanding what other persons are thinking or feeling and, as well, that one has difficulty understanding what kinds of effects one's actions may have on what others are thinking or feeling. Both social aloofness and the indiscriminate social approach of children with an ASD is evidence that they have a theory of mind deficit (Hill & Frith, 2003).

The presence of theory of mind ability has been tested using false belief tasks, such as the "Sally and Anne task" devised from the original work in this area by Wimmer and Perner (1983). (A test which is based on this task is described in the "Instruments" section of the following chapter 5.) This task is successfully completed by a child from around four years of age. This shows that from around this age a child has some rudimentary understanding that people have beliefs and desires about the world and that these mental states affect a person's behaviour (Frith, 1991).

Baron-Cohen, Leslie, and Frith (1985) devised an experiment using the Sally and Anne task which they conducted with a sample of children. For the children in their sample diagnosed as "autistic" according to Rutter's (1978) criteria (aged between 6 and 16.6 years with a mean age of 11.11 years), Baron-

Cohen et al. found that 80% failed the Sally and Anne task. This result was much higher than for the children in the sample who had Down's syndrome (aged between 6.03 and 17.0 years with a mean age of 10.11 years) and for the younger non-disabled children in the sample (aged between 3.5 and 5.9 years).

Although a large percentage of the children with an ASD in the experiment by Baron-Cohen et al. (1985) failed the Sally and Anne task, not all of these children failed this task. This led to further investigation of whether or not all children with an ASD have theory of mind difficulties. Frith (2003) reported that Happé (1994b) reviewed data on children who could pass typical false belief tasks and found that the majority of children with an ASD, however intelligent, could not pass false belief tasks until they had a mental age of around 10 years and that some could not do so even then. Frith considered that this was equivalent to a developmental delay of at least five years (Frith, 2003, p. 94).

In order to test further those children with an ASD who were able to pass simple false belief tasks, Happé developed more advanced theory of mind tests. One set of these stories involved stories relating to everyday life that she called the "Strange Stories" (Happé, 1994a). (Two of these stories are described in the "Instruments" section of the following chapter 5.) In these stories everyday events are portrayed in which people say things that they do not mean literally, such as when they say something sarcastically. In the tests involving these stories, the story is read and questions are asked. Some questions relate to understanding the concrete details in the story and other questions relate to understanding mental states. Happé (1994a) used tests involving the "Strange Stories" in research with a group of children with "autism" who had passed simple false belief tasks and who were matched with controls. She found that the group with "autism" performed significantly worse than the control group on tests involving the "Strange Stories". More generally, she found that children with autism had great difficulty in giving appropriate mental state justifications. Frequently they would give a physical explanation or they would attempt to give a mental justification but it would be incorrect. Joliffe and Baron-Cohen (1999) replicated this finding with individuals with Asperger's Disorder.

Kaland et al. (2002) developed some new advanced theory of mind tests for children who were typically more able to pass simple false belief tasks. These tests involved a set of stories called "Stories from Everyday Life" which were "contextually somewhat more complex" (Kaland et al., 2002, p. 518) than Happé's "Strange Stories". (One of these tests is described in the "Instruments" section of the following chapter 5.) When Kaland et al. used tests involving these "Stories from Everyday Life" to compare a group of children with Asperger's Disorder with a control group of normal children, the control group performed significantly better in making mental inferences. This was also the case when Kaland et al. controlled for age and verbal IQ which indicated that the difficulty the children with Asperger's Disorder had in theory of mind tasks was not related to these factors alone. As well, it was found that the children with Asperger's Disorder were significantly slower in verbally processing their answers than the controls on mental inference tasks.

Brain imaging experiments have added weight to the hypothesis that individuals with an ASD have particular processing problems in relation to theory of mind tasks. Three regions of the brain (medial pre-frontal cortex, temporal-parietal junction, and temporal poles) are typically associated with theory of mind tasks and some research has shown these regions to be less active during these tasks in individuals with an ASD than in controls (Frith, 2001; Nieminen-von Wendt et al., 2003). Other research suggests that the pre-frontal cortex plays a critical role. Using PET scans, Happé and Frith (1996) revealed that individuals with Asperger's Disorder showed less activation in this area during theory of mind tasks.

Executive Functioning Deficits

Executive functioning is a term used to describe a collection of cognitive processes including "the ability to initiate behaviour, inhibit competing actions or stimuli, select relevant task goals, plan and organise a means to solve complex problems, shift problem-solving strategies flexibly when necessary, and monitor and evaluate behaviour" (Gioia, Isquith, Guy, & Kenworthy, 2000, p. 1). These processes are thought to be mediated by the frontal lobes (Duncan, 1986).

A unique feature of a person's executive functioning is its prolonged developmental course in comparison with other cognitive functions (Gioia et al., 2000). For example, the development of attentional control and self-regulation of emotion begins in infancy but continues developing through the primary school years and adolescence.

One kind of executive functioning difficulty is difficulty in initiating new actions. One kind of evidence that an individual has difficulty in initiating new actions is that they repeat previous behaviour. Assuming that executive functioning is mediated by the frontal lobes, the perseverative and repetitive behaviour seen in patients with frontal lobe injury is suggestive that this behaviour is evidence of executive functioning deficits (Happé & Frith, 1996). The difficulties which individuals with an ASD have with any behaviour that is not routine, and the stereotypical behaviours, narrow interests, rigidity, and perseverations in certain behaviours which they exhibit is, then, suggestive that they have difficulty in executive functioning (Hill & Frith, 2003).

Further evidence of executive functioning deficits in individuals with an ASD has been found by several researchers using the Wisconsin Card Sorting Test. This untimed test uses stimulus cards and response cards containing various forms in different numbers and colours. Respondents are required to sort the cards according to different principles (colour, form, or number) and to alter their approach as unannounced shifts in the sorting principle occur during the test administration. Prior and Hoffman (1990) reported deficits in performing this task for individuals with an ASD across all ages and functioning levels. Ozonoff, Pennington, and Rogers (1991) reported that subjects did not have difficulty conceptually understanding the task but they did have significantly more difficulty than controls in perseverative responses and in a failure to maintain set. Such difficulties reflect a deficit in mental flexibility.

A variety of other groups with developmental disorders also demonstrate executive function impairments. Ozonoff (1997) outlined her attempt to determine specific components of executive dysfunction that are impaired in subjects with autism compared to those with executive dysfunction and other clinical conditions. Ozonoff (1997) reported on findings (Ozonoff, Strayer, McMahon, &

Filloux, 1994) that subjects with autism had flexibility impairments not found in subjects with Tourette's Syndrome. She also found that subjects with Attention Deficit Hyperactive Disorder, Schizophrenia, and Obsessive Compulsive Disorder had more marked deficits in inhibition than individuals with autism. Ozonoff (1997) concluded that considering executive functioning as a multidimensional construct was helpful in delineating with more precision the specific executive dysfunctions more likely to be associated with autism.

Neuro-imaging studies have provided direct evidence of decreased frontal lobe activity in the pathology of Autistic Disorder (Zilbovicius et al., 1995). However, it is not yet clear what sub-regions of the frontal region of the brain are specifically associated with the deficits evident in autism. Further research is needed to explore this. In addition, neuro-imaging may clarify if there are associations between the regions of the brain utilised in tasks involving theory of mind, the regions of the brain utilised in tasks involving executive functioning skills, and the regions of the brain utilised in tasks involving central coherence.

Weak Central Coherence

Central coherence is the ability of an individual to integrate various pieces of information to form a coherent whole. Having done this, the individual is able to give meaning to each of these pieces of information within the context of the whole. They are able to make sense of details. By contrast, a person with weak central coherence has difficulty integrating different pieces of information and does not see the overall context in which something happens. They recognise objects as wholes but they do not see these objects in their context. Due to this a person with weak central coherence focuses on details.

One kind of evidence that children with an ASD have weak central coherence is that clinicians have found that they can frequently retell all the specific details of a story but cannot determine the main point of the story or the general meaning of the story. Happé (1994a) suggests that the difficulty which children with an ASD have with theory of mind tasks may relate to a difficulty in "extracting meaning in context" in which case a "deficit in central coherence [may

be] a more universal or persistent impairment in autism than the inability to attribute mental states alone" (p. 146).

Another kind of evidence that individuals with an ASD have weak central coherence is that they have unusual attention or pay preferential attention to some things. As a result, some of them develop special interests or high levels of skill in specific areas.

The tendency of children with an ASD to notice detail has been shown to be an asset in relation to visual-spatial tasks. Frith (2003) cites an experiment by Shah and Frith in 1983 in which it was found that in a test to locate embedded figures, children with "autism" scored above their mental age and were faster and more accurate than normal children of the same mental age. Similarly, the benefits of an ability to see how a larger shape is made up of smaller shapes is demonstrated in the ability of children with "autism" to perform well in the Block Design subtests of the Wechsler intelligence tests (Frith, 2003).

However, weak central coherence has also been shown to be detrimental – especially in tasks in which the stimulus has to be interpreted in context. Hill and Frith (2003) refer to experiments by Frith and Snowling in 1983, Happé in 1997, and Baron-Cohen in 1999 involving homographs (i.e., words spelled the same but with different meanings). In these experiments individuals were asked to read homographs with different pronunciations (e.g., bow) in the context of sentences. Individuals with autism were found to be less likely than controls to pronounce a homograph correctly in the context of a sentence.

The underlying neurological processes involved in central coherence tasks are not fully understood. However, Hill and Frith (2003) refer to one brain imaging study by Ring et al. (1999) in which adults with and without autism underwent Magnetic Resonance Imaging scans while performing the "embedded figures test" (Witkin, Oltman, Raskin, & Karp, 1971). The individuals with autism demonstrated greater activation in the visual cortex while controls demonstrated greater activation in the pre-frontal cortex. This greater activation than the controls in the visual cortex gave the autistic individuals higher skills than the controls in this particular task.

Relating the Triad of Impairments to These Psychological Theories

According to Wing's understanding of ASDs in terms of a triad of impairments, individuals with an ASD have impairment in social interaction, impairment in communication, and rigid, repetitive patterns of behaviour. These impairments are explained to some extent by the psychological theories that individuals with an ASD have theory of mind deficits, executive functioning deficits, and weak central coherence.

Impairments in Social Interaction

The theory that individuals with an ASD have theory of mind deficits provides some explanation of a range of impairments in social interaction. Happé and Frith (1996) explain that the theory of mind deficit proposal makes sense of the observation that individuals with an ASD (particularly the more high-functioning individuals) lack sensitive social reciprocity yet still have a desire to participate socially. They give the example that a child with an ASD may desire rough and tumble play with parents even though he or she still lacks the ability to read and interpret the mental state of others in that play. Attwood (2005) also outlines the effects that theory of mind difficulty will have on a number of social abilities such as an individual's ability to recognise when they are being disrespectful or not, his or her ability to know when it is better to be truthful or not, his or her ability to understand when another's action was deliberate or accidental, his or her awareness of hurting another's feelings, and his or her knowledge of how to repair hurt feelings.

Impairment in Communication

The theory that individuals with an ASD have theory of mind deficits also provides some explanation of more subtle impairments in communication if these impairments are understood more in terms of a failure in the use of language for intentional communication (Happé & Frith, 1996). Frith (2003) explains that normal communication involves tracking the mental states of the other and a realisation that in communication there is "a need to share with the listener a wider context of interaction in which both individuals are actively involved"

(p. 122). Some individuals with an ASD have receptive and expressive language difficulties and in some individuals with an ASD language is virtually absent (Happé & Frith, 1996). However, even individuals with Asperger's Disorder or students with Autistic Disorder who later develop facility with language have subtle difficulties in some areas of language processing. They may have difficulty in terms of their tendency to understand language literally, or in terms of other pragmatic language abilities such as being able to ask for help or to use social language appropriately to support social interaction (Tager-Flusberg, 2003). They may fail to read meaning into communication, lack interest in communicating, and fail to understand the significance of communicating. They may have difficulty understanding the non-verbal aspects of communication. In any of these ways, their language interactions may fail to be effective and mutually engaging.

Restricted, Repetitive, and Stereotyped Patterns of Behaviour

It was noted in the preceding discussion of executive functioning that the theory that individuals with an ASD have executive functioning deficits provides some explanation of their restricted, repetitive, and stereotyped patterns of behaviour, interests, and activities. However, Frith (2003) does not discount the possibility that weak central coherence may contribute to the demonstration of repetitive actions and thought sequences. Just as an individual with weak central coherence does not integrate sensations into a meaningful pattern, so he or she does not recognise that his or her repetitive actions and thought sequences are not part of meaningful action and thought sequences. Frith envisages the possibility that in time links may be found between all of the cognitive theories that help explain the core deficits identified in autism.

Other Functional Difficulties Associated with Autism Spectrum Disorders

As well as having impairment in social interaction, impairment in communication, and rigid, repetitive patterns of behaviour, students with an ASD may also have a range of other specific functional difficulties.

Intellectual Ability

The WISC-IV *Technical and Interpretive Manual* (Wechsler, 2003) refers to studies in which children with Autistic Disorder were found to demonstrate significantly lower general intellectual functioning in all of the composite scores than age matched controls without developmental disabilities. The mean Full Scale IQ of children with Autistic Disorder was 76.4 (*SD* 19.5) and the mean Full Scale IQ of matched controls was 103.9 (*SD* 11.1). These mean Full Scale IQs were found to be significantly different ($p < .01$) (p. 95).

The WISC-IV *Technical and Interpretive Manual* (Wechsler, 2003) also refers to studies in which children with Asperger's Disorder were found to have verbal skills which were very similar to matched controls (p. 96). However, a significant difference with matched controls was found in the Processing Speed Index scores ($p < .01$) (p. 96). The mean Full Scale IQ of children with Asperger's Disorder was 99.2 (*SD* 17.7) and the mean Full Scale IQ of matched controls was 107.1 (*SD* 12.5). These mean Full Scale IQs were not significantly different ($p = .06$) (p. 95).

Higher perceptual reasoning ability in intelligence testing has been found in some other research (e.g., Lincoln, Allen, & Kilman, 1995) but not in all research (Ehlers et al., 1997). Some research has also suggested that the verbal and perceptual abilities indicated in intellectual assessment of children with autism may change over time as the child matures (Mayes & Calhoun, 2003).

Sensory Processing Differences

Sensory processing occurs as an individual's senses receive information from both outside and inside his or her body. This information is needed by the person's nervous system for the person to be able to function consistently and effectively in the world. Therefore, if a person processes sensory input differently, he or she can behave in unusual ways (Huebner, 2001).

In the current DSM-IV-TR and ICD-10 criteria for Autistic Disorder, sensory processing differences are not mentioned as a core feature although "odd responses to sensory stimuli" is noted as an associated feature of Autistic Disorder in DSM-IV-TR. In relation to Asperger's Disorder, neither DSM-IV-TR nor

ICD-10 mentions sensory issues as a core or associated feature. However, it has begun to be increasingly recognised that when children and adults present with the core deficits defined in the diagnostic systems for both Autistic Disorder and Asperger's Disorder, it is very common that they also present with sensory processing differences.

Historically, Kanner (1943/1973) noted how the children he observed could react "with horror" to "loud noises and moving objects" (Kanner, 1943/1973, p. 36), although he saw this problem as being related to the children disliking intrusions from the outside world rather than to the children having sensory processing differences. Asperger's (1944/1991) descriptions also included descriptions about sensory processing differences, particularly in relation to taste, touch, and hearing, with either hyposensitivities or hypersensitivities.

The work of Ayres in the 1970's was helpful in highlighting the importance of sensory processing in child development. This led to research about the sensory processing differences of children with Autistic Disorder. More recently, consideration has been given to the possibility of sensory processing differences being an important underlying feature of Asperger's Disorder as well as Autistic Disorder (Attwood, 1998; Dunn, Myles, & Orr, 2002). A growing number of young adults and adults with an ASD have spoken about the sensory processing difficulties associated with having an ASD (Grandin, 1990; Jackson, 2002; Lawson, 2001; Willey, 1999; Williams, 1998).

With regard to children with Asperger's Disorder, research by Dunn, Myles, et al. (2002) focussed on 42 children (8-14 years of age) diagnosed with Asperger's Disorder and used the Sensory Profile (Dunn, 1999) to ascertain sensory processing differences in this population compared to 42 children without a disability. This research found that there were significant differences (to a $p < .001$ level) between children with Asperger's Disorder and children without a disability. Significant differences were found in all section scores and all factor scores, other than the scores in the Modulation of Visual Input Affecting Emotional Responses and Activity Level section. Sensory profile results from this research had already been published (Myles, Cook, Miller, Rinner, & Robbins, 2000) and these results referred to the percentage of children identified with

sensory processing differences to a level of *definite difference* (at or below the 2nd percentile) or *probable difference* (from 3rd to 16th percentile) in relation to a normal population. The areas of sensory processing in which 50% or more of the children with Asperger's Disorder were indicated to have a definite difference in sensory processing are listed below.

Sections

Auditory Processing 57%

Touch Processing 56%

Multi-sensory Processing 50%

Sensory Processing Related to Endurance/Tone 69%

Modulation of Sensory Input Affecting Emotional Responses 71%

Emotional/Social Responses 67%

Behavioural Outcomes of Sensory Processing 78%

Factors

Emotionally Reactive 76%

Low Endurance/Tone 71%

Oral Sensory Sensitivity 76%

Inattention/Distractibility 64%

Poor Registration 59%

Other research has sought to identify if there are differences in the sensory characteristics of those with Autistic Disorder compared to those with Asperger's Disorder. Using the Sensory Profile (Dunn, 1999), Myles et al. (2004) found that subjects with Autistic Disorder and subjects with Asperger's Disorder both had sensory processing differences. However, they also found that subjects with Asperger's Disorder had higher levels of sensory processing differences than subjects with Autistic Disorder in the Auditory Processing, Touch Processing, Modulation of Sensory Input Affecting Emotional Response and Activity Level, and Emotional/Social Responses sections and in the Emotionally Reactive and Inattention /Distractibility factors (Myles et al., 2004, pp. 287-289).

Motor Difficulties

Clumsiness is not mentioned in the DSM-IV-TR (American Psychiatric Association, 2000) or the ICD-10 (World Health Organization, 1993) as a core

diagnostic feature of Autistic Disorder or Asperger's Disorder but clumsiness is mentioned in both as a possible additional feature of Asperger's Disorder.

Asperger (1944/1991) mentioned that the children he observed were clumsy in their gross motor movements and exhibited poor coordination. He also specifically mentioned in descriptions of three of the children that they had considerable difficulty with handwriting. Others have also observed that children with Asperger's Disorder lack synchrony in the movement of their arms and legs (Gillberg, 1989) and parents and teachers report that children with Asperger's Disorder often have difficulty with physical education and fine motor tasks. Some studies point to the prevalence of motor difficulty in those with Asperger's Disorder (Green et al., 2002).

There has been discussion concerning whether or not clumsiness should be included as a specific additional diagnostic feature of Asperger's Disorder (Ghaziuddin, Butler, Tsai, & Ghaziuddin, 1994; Gillberg, 1989; Green et al., 2002; Smith, 2000). Research by Iwanaga, Kawasaki, and Tsuchida (2000) was conducted with preschool aged children (10 with Asperger's Disorder and 15 with Autistic Disorder but not intellectual disability) and compared their motor functioning using the Miller Assessment for Preschoolers (Tsuchida, Sato, Yamada, & Matsushita, 1989). The children with Asperger's Disorder scored significantly lower in the Foundations Index than the Autistic Disorder group, which indicated that the group with Asperger's Disorder had lower motor functioning. However, both the group with Asperger's Disorder and the group with Autistic Disorder scored significantly lower in the Foundations Index and the Coordination Index than predicted by their intellectual ability. The authors conclude that although the group with Asperger's Disorder had greater motor impairment, both groups had considerable motor impairment, so that motor impairment could not serve as a diagnostic feature to distinguish children with Asperger's Disorder from children with Autistic Disorder who did not have an intellectual disability.

Some have hypothesised that motor dysfunction across the autism spectrum relates to an underlying deficit in executive functioning (Green et al., 2002; Smith, 2000). According to this theory clumsiness arises out of a difficulty

to form a plan of the required sequence of movements and to hold the plan in working memory. Given that executive functioning difficulties are thought to be a core deficit in ASDs (Russell, 1997), this theory may help explain the frequency of some level of motor dysfunction across the entire autism spectrum.

Academic Difficulties

There is limited research in relation to the academic skills of students who have an ASD and the results which have been obtained are mixed (Mayes & Calhoun, 2003; Myles et al., 2002; Myles et al., 2003; Reitzel & Szatmari, 2003).

Research by Mayes and Calhoun (2003) was undertaken with a sample of children with Autistic Disorder. The sample was divided into a group with IQ below 80 and a group with IQ above 80. For children aged 3 to 7, IQ was measured using the Stanford-Binet Intelligence Scale: Fourth Edition (Stanford-Binet: IV; Thorndike, Hagen, & Sattler, 1986). For children aged 6 to 15, IQ was measured using the Wechsler Individual Scale for Children – Third Edition (WISC-III; Wechsler, 1991) and academic ability was measured using the Wechsler Individual Achievement Test (Wechsler, 1992). These children were said to have a Specific Learning Disability when their academic ability was found to be two standard deviations or more lower than the level of academic ability predicted by intellectual functioning.

For the children whose IQ was measured using the Stanford-Binet: IV, it was found that the academic abilities of the children in the high IQ group were equivalent to their IQ. The children in the low IQ group could not complete the tests of academic ability being used. However, for the children whose IQ was measured using the WISC-III, it was found that for children in the high IQ group, most of the children's reading ability was consistent with IQ but 7% had a Specific Learning Disability in relation to reading. It was also found that 22% in the high IQ group had a Specific Learning Disability in relation to maths and that 63% in the high IQ group had a Specific Learning Disability in relation to written expression (Mayes & Calhoun, 2003). For children in the low IQ group, their reading ability was significantly higher than IQ and their spelling and maths abilities were equivalent to IQ. These children were not able to complete the

reading comprehension and written expression achievement tests, so it was concluded that they had low ability in these areas. There was, thus, evidence in this research that for children aged 6 to 15, children with Autistic Disorder and an IQ above 80 have a greater incidence of Specific Learning Disability than those with an IQ below 80, and this was notably the case in relation to written expression.

Some work on academic skills has also been undertaken specifically in relation to students diagnosed with Asperger's Disorder (Griswold, Barnhill, Myles, Hagiwara, & Simpson, 2002; Myles et al., 2002; Myles et al., 2003) but conclusions are difficult given that there is not consistency in the tests that are used and IQ was not always part of the analysis. However, significant differences were found between the reading level and actual grade level of students with Asperger's Disorder in both independent reading and silent reading (Myles et al., 2002) and students with Asperger's Disorder were found to have motor difficulty in the formation of letters when undertaking handwriting (Myles et al., 2003).

Emotional and Behavioural Problems

Children with an ASD have also been reported to have anxiety and depression. Kanner (1943/1973) wrote that the children in his original study "had an all powerful need for being left undisturbed" and that "everything that changes [their] external or even internal environment" was a "dreaded intrusion" (p. 36). He also suggested that the children's insistence on sameness and their stereotyped behaviours and obsessions were anxiety driven. Others, too, have suggested that repetitive behaviours may increase when a child is anxious and may act as a self-calming strategy (Howlin, 1998). As well, in considering the emotions of children with an ASD, it may be noted that Asperger wrote in his observations of his subjects of a "disharmony in emotion and disposition" (Asperger, 1944/1991, p. 83).

In relation to symptoms of depression, Ghaziuddin, Ghaziuddin and Greden (2002) suggest that in lower functioning individuals with an ASD, a regression in level of functioning, severe appetite, sleep, and weight disturbance, and, in some cases, aggression may be signs of depression. Making a diagnosis of

depression can be difficult in lower functioning individuals with an ASD because of their severe limitations in communicating feeling states (Lainhart & Folskin, 1994). However, Ghaziuddin et al. (2002) also suggest that in higher functioning individuals with an ASD, signs of depression are not likely to be expressed verbally, despite their better verbal skills. This is because it is still difficult for them to express feelings of sadness verbally. Therefore, Ghaziuddin et al. suggest that depression is more likely to be demonstrated in terms of behaviour, such as an increase in obsessions and stereotypical behaviours or a total loss of interest in their usual preoccupations. Increased withdrawal, depressed mood, sleep disturbance, or change in appetite may also be signs of depression. Ghaziuddin et al. also suggest that hyperactive symptoms rather than depressive symptoms may be more evident in childhood, but that other forms of depressive symptoms increase with age.

As a general precaution in relation to identifying depression, Tantum (2003) makes the point, in relation to individuals with Asperger's Disorder, that their emotional reactions may be highly individualised. Therefore, it may be wise not to make assumptions in relation to individuals across the entire autism spectrum about exactly how they may demonstrate depression. It is possible that individuality of expression may also apply to how individuals with an ASD demonstrate anxiety.

It may be asked whether anxiety and the emotional problems of children with an ASD are caused by their underlying cognitive difficulties. For example, it may be asked whether the theory of mind difficulties of children with an ASD leads them to experience confusion in understanding the behaviour of others and to have constant difficulty in managing in social situations which is the underlying cause of their experience of anxiety and emotional problems. It may also be asked whether stress factors for them in terms of sensory processing difficulties cause sensory overload which results in stress and anxiety. It may also be asked whether a range of other difficulties (e.g. their academic difficulties) are a source of stress and anxiety.

Within the autism field there is uncertainty as to whether presenting mood and behaviour problems are manifestations of the core diagnostic symptoms of

autism or represent distinct co-morbid psychiatric diagnoses (American Academy of Child and Adolescent Psychiatry, 1999). It is not yet known how often these additional difficulties are outside the DSM-IV-TR definition of Autistic Disorder or Asperger's Disorder (Leyfer, 2006). However, there has been an increasing amount of research recognising that individuals across the entire autism spectrum exhibit mood and behavioural difficulties in conjunction with the features that define autism.

In a six year follow up to an earlier study, research by Kim, Szatmari, Bryson, Streiner, and Wilson (2000) compared a community sample of children with a sample of children with an ASD. The children with an ASD were 9 to 14 years of age and they were either children who had Autistic Disorder (but did not have intellectual disability) or they were children who had Asperger's Disorder. In comparison with the community sample, the sample of children with an ASD demonstrated higher rates of mood and anxiety problems. Significant differences were found between the sample of children with an ASD and the community sample both in relation to anxiety and mood disorders and in relation to disruptive behaviours. In relation to anxiety and mood disorders, significant differences were found in relation to depression and generalised anxiety, disruptive behaviours, and attention deficit/hyperactivity. Almost a fifth of the children with an ASD were found to have clinically relevant levels of depression (p. 128). With regard to the relationship between emotional problems and behavioural problems in children with an ASD, Kim et al. (2000) also found that anxiety and mood problems were highly correlated with aggressive and oppositional behaviour.

Research by Gillott, Furniss, and Walter (2001) also sought to compare "high functioning children with autism" who "attended mainstream school" with normal children. The "high functioning children with autism" were found to have significantly higher levels of anxiety than the normal controls (p. 281). As well, in the research by Gillott et al. (2001) the "high functioning children with autism" were compared with children with a specific language impairment. This comparison was made because it was believed that the language impaired children might experience some anxiety when managing in social situations given their language difficulties. However, the "high functioning children with autism" were

found to have significantly higher levels of anxiety than the language impaired group (p. 281). These results therefore suggested that the anxiety of the children with autism was not only due to their language difficulties.

There is some evidence that the emotional problems of children with an ASD are caused by their sensory processing difficulties. Research by Pfeiffer, Kinnealey, Reed, and Herzberg (2005) found that sensory processing disorders were significantly associated with elevated anxiety and depressive symptoms in children with Asperger's Disorder. Their research has established a correlation between sensory modulation difficulty and depression but there is generally little research that has established a direct causal link. It is, however, generally accepted by professionals working in the field that sensory difficulties do affect the behaviour of students with an ASD.

It is also generally recognised by professionals working in the field that the "stress" experienced by the individual with autism may arise from a number of environmental stressors. This may include difficulty in having to face social situations with inadequate social awareness and understanding, as well as difficulty in being flexible and able to problem solve in social situations (Attwood, 1998; Cumine, Leach, & Stevenson, 1998) and a range of other potential stressors. It is also commonly recognised that an individual's response to 'stress' may be demonstrated by withdrawal, reliance on special interests, inattention, hypersensitivity, aggression, rage, or "meltdowns" (Adreon, 2006; Attwood, 2006; McAfee, 2002).

With regard to whether or not the level of mood, anxiety and behavioural issues differ between diagnostic groups within the autism spectrum, Tonge, Brereton, Gray, and Einfeld (1999) diagnosed subjects 4 to 18 years of age according to DSM-IV criteria into a group who had Autistic Disorder (but did not have intellectual disability) and a group who had Asperger's Disorder (but did not have intellectual disability or any history of significant language delay). Using the Developmental Behaviour Checklist (Einfeld & Tonge, 1994) it was found that 65% of the Autistic Disorder (without intellectual disability) group and 85% of the Asperger's Disorder group met the Developmental Behaviour Checklist cut-off criteria for clinically significant levels of behavioural and emotional

disturbance (Tonge et al., 1999, p. 123). It was also found that the Asperger's Disorder group had significantly higher Total Behaviour Problems as well as significantly higher problems in the Disruptive, Anxiety, Autistic/Social Relating, and Anti-Social subscales than the Autistic Disorder (without intellectual disability) group (Tonge et al., 1999, p. 123). These results indicated that although all of the children and adolescents in the sample had high levels of behavioural and emotional disturbance, the Asperger's Disorder group showed higher levels of overall problems. In particular, these results indicated that the Asperger's Disorder group had extreme symptoms of anxiety and disruptive behaviours. However, the results of Tonge et al. differ from Kim et al. (2000) in that Kim et al. found that, for their group of children with an ASD, measures of depression and generalised anxiety did not differ significantly between the children with Autistic Disorder (without intellectual disability) and the children with Asperger's Disorder (Kim et al., 2000, p. 129).

Implications for the Education of Students with Autism Spectrum Disorder

The evidence that ASDs are neurological disorders means that the complex and diverse range of difficulties experienced by individuals with an ASD may result from underlying neurological abnormalities. To the extent that it is not possible to change these underlying neurological abnormalities, it will only be possible to influence the learning of a student with an ASD through understanding how he or she will learn best. In addition, the difficulties which a student with an ASD experiences often overlap. As well, these difficulties in functioning are likely to increase the stress experienced by the student (Attwood, 2006; Twachtman-Cullen, 2006). The combination of these difficulties presents a challenge for those involved in the teaching and support of students with an ASD. It is vitally important that teachers understand the specific difficulties that these students are likely to have and that teachers are well educated and knowledgeable about specific interventions that may be supportive.

Support of Theory of Mind Deficits

Given that students with an ASD have theory of mind deficits, social skills will need to be an explicit and important part of their curriculum. Students with an ASD will need to be taught that other people have thoughts, feelings, and beliefs and they will need to be taught about appropriate responses to emotions (Attwood, 2000). They will also need to be taught that they may need to speak to others about their own thinking, feelings, and beliefs. Understanding of their own emotions and of other people's emotions, as well as appropriate responses to emotions, may be increased though specific programs such as Attwood's program, *Exploring Feelings: Cognitive Behaviour Therapy to Manage Anxiety* (Attwood, 2004). Gray also explains a technique for increasing social skills by visually representing thoughts, feelings, and beliefs as "comic strip conversations" (Gray, 1994a).

As students with an ASD learn social skills, various social support structures will need to be established for them as they continue to learn social skills (Bauminger, 2002). For example, during lunchtime a club supervised by an adult could be the set up around an interest area (e.g., chess).

Because a student with an ASD has difficulties in relation to theory of mind, they have difficulty understanding the intentions of others and this increases their social vulnerability and, in particular, their vulnerability to being bullied (Jackson, 2002). It is now known that students with an ASD are likely to be the target of teasing and bullying (Attwood, 2000; Heinrichs, 2003; Lawson, 2003). Estimates of the number of primary school students in the general population targeted by bullying once or more a week are around 24% (Slee, 1995), but recent research regarding students with an ASD through Autism South Australia using a similar methodology found that 56% of these students reported experiencing bullying on a weekly basis (Bottroff, Slee, & Zeitz, 2005). Taking account of theory of mind deficits, teachers need to be aware of the social vulnerability of students with an ASD and need to consider what social supports can be put in place.

The difficulty which a student with an ASD has with tasks involving theory of mind skills affects not just the student's ability to interact socially but

also their ability to function in a classroom (Cumine et al., 1998; Jordan & Powell, 1995). For example, taking account of a student's theory of mind deficits, a teacher would not assume that the student understood the teacher's intentions. Rather, the teacher would explicitly state their intentions using unambiguous language or clearly expressing their intentions by some other means (e.g., in a visual schedule) (Hodgdon, 1995).

Support of Executive Functioning Deficits

Having executive functioning difficulties implies having a range of impairments in areas such as planning, organisation, flexibility, and self-regulation. Having skills in all these areas is critical to successful functioning in a classroom, and yet these skills are hidden and subtle skills that are often poorly understood by teachers (Ozonoff, 1998). Given that students with an ASD have executive functioning difficulties, they will need to be supported in managing these difficulties (Ozonoff, 1998; Quill, 1997). One general way in which teachers can support students with these difficulties is by establishing consistent classroom rules and routines. With regard to a particular task, the teacher may need to make the beginning and end points of the task clear. As well, the teacher may need to break tasks down into clearly identifiable steps and to provide checklists to help the student to self-monitor. If the teacher asks the student to make a choice, they may need to make it very clear what the student's options are. If the teacher gives the student a written expression task, they may need to help the student in generating and sequencing ideas. In addition, the teacher will need to prepare the student for changes and to support them in making transitions from one activity to another (Cumine et al., 1998; Ozonoff, 1998).

In order to support executive functioning difficulties, the use of visual information and supports may be important, given that visual stimuli are not transient, as are auditory stimuli, and that students may then refer back to the visual information. For example, it may be important to model what a final goal might look like. The importance of using visual supports applies to students with Asperger's Disorder as much as to students with Autistic Disorder, even though students with Asperger's Disorder have greater facility with language than

students with Autistic Disorder. Given that executive functioning skills are critical to everyday functioning, as well as to functioning in a school environment (Ozonoff, 1998), teaching planning and organisational strategies to a student with an ASD has the long term aim of improving their independent living skills later in life (Hill & Frith, 2003).

In addition, supporting a student's executive functioning deficits may help their stress levels. An adequate executive functioning system makes it possible for students to maintain attention to the task, to control impulses and self-regulate, and to be able to flexibly transition from one task to another (Twachtman-Cullen, 2006). An inadequate system means that a student is at the mercy of their immediate surroundings with no internal source of self-regulating control. Twachtman-Cullen believes that this leads to a "near constant source of anxiety and stress" (p. 306).

Support of Weak Central Coherence

A student with an ASD will also require support given their difficulties in terms of weak central coherence. Cumine et al. (1998) point out some of the difficulties that a teacher may have in relation to this. They state, "The [student] will not necessarily focus on what...the teacher may consider to be the obvious focus of attention, or point of the task", and, "What appears prominent to the [student] will determine [their] perspective on the learning situation" (Cumine et al., 1998, p. 26). Therefore it will be important for the teacher to highlight what she or he intends the student's focus of attention to be. The teacher may do this by using a visual prompt or cue. In addition, given the weak central coherence of a student with an ASD, a teacher may have to help the student to make connections by being explicit. The student will not necessarily realise that skills acquired in one situation also apply to a new situation, so the teacher will need to explicitly draw associations between knowledge previously acquired and new knowledge.

Support of a Range of Deficits

As well as considering the educational implications of the theory of mind deficits, executive functioning deficits, and weak central coherence of a student

with an ASD, the educational implications of the other difficulties and problems that a student with an ASD may have may be considered. They may have marked receptive, expressive, or pragmatic language difficulties. They may also have sensory processing difficulties, motor difficulties, academic problems, and emotional and behavioural problems. It is important that each student with an ASD is assessed in order to determine what particular difficulties and problems he or she has.

The language difficulties of students on the autism spectrum need to be assessed and understood by teachers. The difficulties in this area range from marked difficulties to subtle difficulties but, whatever the difficulties, teachers will need to adequately consider how these difficulties may be affecting the student's classroom participation and their academic and social learning. It is likely that concrete communication supports will need to be put in place (Hodgdon, 1995).

The sensory processing difficulties of students with an ASD need to be assessed so that appropriate accommodations can be made (Dunn, Saiter, & Rinner, 2002). For example, a student might be allowed to have more break times in order to limit the possibility that he or she becomes sensorily overloaded (Cumine et al., 1998; Yack, Sutton, & Aquilla, 2002).

If a student has motor difficulties in relation to cutting, pasting, handwriting, or in relation to subjects such as physical education, appropriate accommodations will need to be made (Attwood, 1998).

If a child has a Specific Learning Disability in relation to one or more academic areas, his or her difficulties will then need to be taken account of and supported in a school environment (Klin, Sparrow, Marans, Carter, & Volkmar, 2000; Manjiviona, 2003).

If environmental stress leads to or triggers anxiety and negative and spiralling emotional and behavioural consequences, strategies that can prevent or reduce these consequences need to be put in place (Adreon, 2006; McAfee, 2002). For teachers this may mean consideration of a range of potential stressors in the classroom and playground. These may include sensory difficulties, cognitive difficulties, communication difficulties, motor difficulties, academic difficulties,

and social difficulties (Attwood, 2006; Groden, Le Vasseur, Diller, & Cautela, 2002; Twachtman-Cullen, 2006). *Stress tracking* as suggested by McAfee (2002) may also be an important tool in order to help teachers to recognise potential stressors and to also plan appropriate interventions at different levels of stress.

A student with emotional and behavioural problems at school may also be a child with emotional and behavioural problems at home (Attwood, 1998). Therefore, early and effectual interventions which prevent emotional and behavioural problems at school may well prevent emotional and behavioural problems at home. This may well prevent increased family stress and so have benefits for families.

Research by Bartak et al. (2006) was based on a conceptual model that increasing environmental stress builds on the core deficits of autism and can lead to increasingly problematic behavioural and mood problems. (Refer to Appendix A for a diagrammatic representation.) They report on an intervention model that was put in place to support students with an ASD who were presenting with very challenging behaviours. Intensive, multi-level support was put in place for the students and family. The support included individual support for the student, counselling using a cognitive-behaviour approach to learn better coping skills, parent and sibling education and support, and increased communication with the school. It was found that the combination of approaches led to considerable stress reduction for the student with an ASD and an improvement in the emotional state of the student and their families.

The Potential Mismatch between Autistic Difficulties and School Expectations

The characteristics and particular difficulties of students with an ASD are often diametrically opposed to the skills required for functioning ably in a mainstream school. Table 3.1 is reproduced from Kunce (2003) and it highlights the difficulties that a student with an ASD may have in a school environment. Details in the table refer in particular to students at the higher end of the autism spectrum. However, the mentioned characteristics are relevant to all students with an ASD who are in a mainstream school.

Table 3.1

Selected Examples of the Potential Mismatch between Student and Classroom Characteristics

Characteristics of students with Asperger Syndrome or High Functioning Autism	Characteristics of traditional classroom environments
Cognitive-organizational	
Difficulty organizing time, tasks, materials	Students expected to start, complete, and turn in work with appropriate independence
Absorption in own unique interests	Teachers use age-typical interests to motivate students
Facility with facts and details versus abstract reasoning	Emphasis on conceptual themes; facts used in service of more complex understanding
Social communication	
Less engagement in group activities (e.g., on periphery at recess, "lost" in class)	Group learning activities; formation of group identity; emphasis on group rules
Impaired understanding of others' non-verbal communication	Teacher intentions communicated through emotional expression, voice tone, gestures
Impairments in complex auditory comprehension	Emphasis on teaching through talk (i.e., lectures, verbal instructions, etc.)
Behavioural-emotional	
Desire for sameness and repetition	Changes in school routines (e.g., assembly) expected to delight students
Reduced control over outbursts, especially in response to sensory stimuli	Student outbursts interpreted (and punished) as intentionally disruptive
Limited understanding of own and others' emotional responses	Teacher use of social-emotional reasoning (e.g., "How would you feel if...?")
Other	
Impaired application of concepts and skills in real-life contexts	Limited inclusion of real-life skills in academic curriculum
Atypical sensory reactions and related problematic behaviours	Teacher use of contingency management to address problematic behaviour rather than modifying antecedent stimuli
Impaired gross and fine motor skills	Value group sports and athletic prowess; emphasis on written work

Note [by Kunce]. Selected research and clinical references for student characteristics include American Psychiatric Association (2000); Attwood (2000); Dunn, Myles, et al. (2002); Ghaziuddin et al., (1998); Konig et al., (2001); Landa (2000); Mercier et al., (2000); Minshew et al., (1997); and Ozonoff (1998). [From "The Ideal Classroom," by L. J. Kunce, in *Learning and Behaviour Problems in Asperger Syndrome*, ed. M. Prior, New York: The Guilford Press.]

The potential mismatch between the characteristics and particular difficulties of students with an ASD and the skills required for functioning ably in a mainstream school helps explain the difficulties teachers often experience in managing these students in the school environment and it also highlights why teachers often feel inadequately supported. This mismatch also explains why some students with an ASD have been very unhappy at school (Lawson, 2003). A similar potential mismatch between the characteristics and skills of students with an ASD and the skills needed in the playground would explain why these students do not have fun and are "seemingly lost and struggling" in the playground (Gray, 1994b, p. 2). Some students with an ASD may appear to survive in a mainstream school but even so one needs to also ask if they are reaching their full potential with their strengths being adequately developed (Kluth, 2003; Kunce, 2003).

There is, then, a question about whether one sort of educational setting rather than another will provide more effectively for the full range of needs of a student with an ASD. Is the appropriate school option for a student with an ASD a mainstream school, occasional special classes in a mainstream school, a special school unit within a mainstream school, a Special Development School, a special school for students with an ASD, some time in a mainstream school and some time in a special school, or some other option? Very little research has been conducted on the impact of different educational settings on a student with an ASD (Jones, 2006). However, the current reality is that many children with an ASD will be placed in a mainstream school, especially if they do not have severe intellectual disability. It is also the reality that in most mainstream schools there will be few special classes for students with an ASD and few times when students with an ASD are withdrawn from class to work individually with a special needs teacher or a teacher aide. It is the classroom teacher who will be primarily responsible for the student. The question then is: how can a mainstream school and teachers be supported to include students with an ASD?

CHAPTER 4
EDUCATIONAL INTERVENTIONS AND MODELS OF SUPPORT,
THE FORMULATION OF A PROJECT, AND HYPOTHESES.

Research about Educational Interventions

How can a mainstream school and teachers be facilitated to include students with an ASD? Assuming that the inclusion of students with an ASD in mainstream schools will involve educational intervention, there is the prior question of which educational interventions for these students are effective. In the present absence of clear evidence relating to this question, it is, at least, possible to look for guidance to evidence regarding early interventions for children with an ASD (i.e., interventions prior to children attending school).

With regard to evidence about early intervention programs for children with an ASD, there are problems in relating this evidence to the question of which educational interventions should be used for this population of children in a mainstream school setting. Firstly, it is highly unlikely that an intervention in a mainstream setting will be able to be as intense or as highly staffed as an intervention in an early intervention setting. Secondly, there is evidence that many children with an ASD with less obvious early behavioural symptoms are not diagnosed until they are of school age (Eisenmajer et al., 1996) and so they will not have been able to be part of an early intervention program. Often children who are diagnosed with autism later are also more likely to be children who are sometimes called higher functioning children and little research has been undertaken with this group of children in relation to the interventions used in the early intervention programs.

These problems aside, there are a number of early intervention programs that have been used for children with an ASD. These early intervention programs have included behaviourally based programs such as the Lovaas program which is based on applied behaviour analysis (Lovaas, 1987), developmentally based programs such as Greenspan's "Floor Time" (Greenspan, Wieder, & Simons, 1998), family-based approaches such as the Hanen Program (Sussman, 1999;

Weitzman & Sussman, 1997), and intervention programs that structure the environment such as the Treatment and Education of Autistic and related Communication handicapped CHildren (TEACCH) program (Mesibov & Howley, 2003). Considerable effort has been put into determining which early intervention programs are the most effective and there have been reviews of intervention programs for children with an ASD (Dawson & Osterling, 1997; Gresham, Beebe-Frankenberger, & Macmillan, 1999; Jordan, Jones, & Murray, 1998; Simpson, 2005; Simpson et al., 2005). There is currently no consensus about one program being definitely better than any other. Dawson and Osterling (1997) conclude that "it remains unclear whether rate of progress is related to child characteristics such as IQ and language ability [rather than early intervention]" (p. 308) and Jordan et al. (1998) comment, "It would be surprising if consistent and systematic work with a child with an ASD did not produce some beneficial results, whatever the approach" (p. 4).

What has been helpful from the reviews is the identification of common elements in early intervention programs and the consensus about the benefits of early intervention. Dawson and Osterling (1997) found that there were common elements in all the early intervention programs for children with an ASD that they reviewed. These common elements were:

- curriculum content emphasising five basic skill domains:
  1. "ability to attend to elements of the environment that are essential to learning,"
  2. "ability to imitate others,"
  3. "ability to comprehend and use language,"
  4. "ability to play appropriately with toys,"
  5. "ability to socially interact with others." (pp. 314-315)
- "highly supportive teaching environments and generalisation strategies" (p. 315)
- predictability and routine
- a functional approach to problem behaviours through understanding the cause of these behaviours

- facilitation of successful transitions from pre-school to the first year of school and placements beyond pre-school

- involvement of parents in the education of their child.

Jordan et al. (1998) found that there was consensus in regard to the benefits of early intensive education especially when it "involves the parents and includes direct teaching of essential skills with an opportunity for planned integration [to a school setting]" (p. 4).

The question needs to be asked though, how do the identified essential core components of effective early intervention apply to an educational program for students of school age? Iovannone, Dunlap, Huber, and Kincaid (2003) analysed several reviews of effective intervention programs for students with an ASD, including Dawson and Osterling's review, in order "to present a set of effective core components" that "should be considered and included in any educational programs for students of all ages with ASD" (p. 151). Iovannone et al. recognised that the "six essential themes or components" to be included in an effective educational program for students with an ASD were:

"1. individualized supports and services for students and families,

2. systematic instruction,

3. comprehensible and/or structured environments,

4. specialized curriculum content,

5. a functional approach to problem behaviours, and

6. family involvement." (p. 153)

Included in Iovannone et al.'s core components is an emphasis on the importance of individual assessment and the formulation of individual learning plans for students with an ASD. This is also frequently emphasised by clinicians working in the field (Jordan, 2005; Kunce, 2003; Simpson, 1995).

In addition to analysis of the effective core components in an educational program for school-age children with an ASD, there is now a small but growing amount of research data with regard to specific interventions for these children. For example, Bauminger (2002) has studied the outcomes of cognitive-behavioural interventions to facilitate social-emotional understanding and social interaction for school aged children in a mainstream setting.

The Treatment and Education of Autistic and Related Communication

Handicapped Children Program

Although no single approach to intervention has been shown to be definitely better than another, the Treatment and Education of Autistic and related Communication handicapped Children (TEACCH) program has much to offer in an educational mainstream setting, especially in terms of its emphasis on using structured supports to help overcome some of these children's processing difficulties. The TEACCH program was developed by Eric Schopler. His work began in the late 1960's and developed further in the 1970's in conjunction with the University of North Carolina. Division TEACCH, North Carolina's state-wide program serving people with ASDs and their families, has been active in developing intervention programs. The TEACCH program is helpful in a school setting in that it aims to understand how a child with an ASD processes information, thinks, and learns (Schopler, Mesibov, & Heasey, 1995). From this starting point, teachers trained in TEACCH principles aim to support the student with an ASD with regard to their neurologically-based difficulties so that they can gain from the educational opportunities available to them in their particular educational setting.

Structured educational intervention is the key feature of TEACCH principles. This was also identified as a core feature of effective intervention programs by Dawson and Osterling (1997) and Iovannone et al. (2003). For some time there has been agreement about the effectiveness of structured educational interventions for children with an ASD. Research in the 1970's linked structured teaching practices with positive educational outcomes (Bartak, 1978; Bartak & Pickering, 1976; Rutter & Bartak, 1973). Bartak and Pickering (1976) outlined that a structured teaching program needed to include assessment, the setting of detailed learning goals that were relevant to the child's development, and the organisation of the child's learning environment. Structured educational intervention has been the foundation of the educational approach promoted by the TEACCH program.

The TEACCH program has two complementary goals. It aims to modify the environment and tasks according to the individual's needs and it aims to

increase the individual's skills (Mesibov, Shea, & Schopler, 2004). The four main components of the program are physical organisation, visual schedules, work systems, and task organisation. These components in structured teaching utilise the relative strengths that a student with an ASD has in the areas of visual processing and visual spatial skills. Structured teaching through these means seeks to help the student understand what is happening and what is expected. This is considered to be very important in order to support students with an ASD to overcome the deficits they have in executive functioning and weak central coherence. Through structured support it is believed that learning can be enhanced, that independence can be facilitated, and that problem behaviours may decrease (Kunce & Mesibov, 1998). Challenging behaviours are dealt with by understanding from the perspective of the student the underlying causes of these behaviours. In this way it is hoped that problem behaviours will be prevented and that the student will be helped to engage in more productive behaviour.

In the TEACCH program assessment and individualised program goals are considered important to support the student and to develop the student's strengths (Cumine et al., 1998). Emphasis is placed on developing a student's communication skills and a number of intervention strategies may also be used to support a student's social, emotional, and academic learning (Kunce, 2003; Kunce & Mesibov, 1998).

In addition, a very important element of the TEACCH program is the affirmation of parents as equal partners throughout the program. Parents are seen as a resource and as an important source of expertise (Mesibov et al., 2004). It is also understood that parents have a major role in supporting their child for many years - until the child reaches a measure of independence or for life - and that this adds importance to the need for parents to be equal partners in the child's education. The TEACCH program is somewhat different from other programs in that it is a *whole of life* program. This means that it focuses on how to support individuals and their families throughout the whole of their lives, not only in early learning, but also in preparing them for living more independently and for being able to be involved in some form of employment.

Over the years Division TEACCH has undertaken much research in relation to diagnostic assessment, autistic characteristics, the development of communication skills, the benefits of parental involvement, and other matters (*TEACCH Research Report*, 1996). However, there has been relatively little research that has evaluated the outcomes for students in educational programs based on TEACCH principles, and even less research that has used controlled studies to evaluate the outcomes.

Gresham et al.'s (1999) review of treatment programs for children with Autistic Disorder included an evaluation of the empirical evidence for the effectiveness of the TEACCH program. They concluded that no research to that time gave sufficient empirical evidence for the efficacy of TEACCH methods, even though they commented that "methods used by TEACCH seem intuitively appropriate" (p. 566).

Simpson et al. (2005) have also evaluated the benefits of TEACCH and the research evidence in relation to its benefits. They too recognised that there were "few recent peer reviewed studies…that directly address benefits of structured teaching methodology" (p. 121). However, they also say that practitioners have found the strategies useful, and they conclude that "the use of structured teaching is likely to lead to a better understanding on the part of the students, which will enable individuals with ASD to be more independent and productive in their lives" (pp. 124-125). Simpson et al.'s final rating in regard to TEACCH is that it is a "Promising Practice" (p. 125).

It may be noted that the problems in conducting research relating to the implementation of TEACCH principles are problems for any research involving children with an ASD, namely, that it is likely that small samples are involved and that there are problems in controlling program implementation in the way that a more medical treatment could be controlled.

The writer knows of only two studies with children that have used controlled designs. In the first of these, Ozonoff and Cathcart (1998) compared the outcomes of a treatment group of children diagnosed with Autistic Disorder who received four months of TEACCH-based home program services with the outcomes of a matched control group of children who received no home program.

The children in both groups regularly attended their day treatment program. They were tested before and after the intervention using the Psycho-Educational Profile – Revised (PEP-R; Schopler, Reichler, Bashford, Lansing, & Marcus, 1990). This is a developmental assessment tool devised by Division TEACCH which assesses children with an ASD. The PEP-R scores showed that the children in the treatment group improved significantly more than those in the control group in the subtests of imitation, fine motor, gross motor, and nonverbal conceptual skills, as well as in the overall total scores.

The second study known to the writer that used a controlled design and that implemented a program based on TEACCH principles was a repeated measure study that found benefits in relation to the overall development of lower functioning students with an ASD. Panerai, Ferrante, and Zingale (2002) compared the outcomes of an experimental group of children with Autistic Disorder and severe intellectual disability in a residential educational setting who were supported using TEACCH principles with the outcomes of a matched control group of children in a regular setting who received their usual support. The PEP-R was used to assess the children. It was found that the experimental group receiving educational support using TEACCH methods made significant gains in imitation, perception, gross motor skills, hand-eye coordination, cognitive performance, total score, and developmental age whereas the control group only made significant gains in hand-eye coordination.

Comprehensive Structured Educational Programs

No research is known to the writer that evaluates a school-based educational intervention for higher functioning students with an ASD that utilises TEACCH principles. The only research known to the writer that evaluates a comprehensive educational intervention is the research regarding the ABCD Model for Supporting Students with Autism (Antecedents, Behaviours, Consequences, Data) which had been implemented in Iowa, USA, and surrounding states (Ikeda, Tucker, & Rankin, 2002). This model was designed to develop, validate, and disseminate a training program for teachers of students with "Autism", that is, Autistic Disorder. The teacher training involved five sequential

days of training and ongoing teacher support was available from an Autism Support Team when requested. The training covered "characteristics of Autism, using visual schedules and structure in the classroom, developing communication skills through routines, independence, promoting social interaction, and managing behaviour." (p. 13).

The research included results for 53 students between the ages of two and eight who were in the project for a range of time of up to five years. The study was not controlled, but used pre and post testing results. A significant improvement in cognitive skills was found using the Woodcock Johnson Tests of Cognitive Ability (Woodcock & Johnson, 1990). Using the Ritvo-Freeman Real Life Rating Scale (Freeman, Ritvo, Yokota, & Ritvo, 1986), it was found that there was a significant decrease in some behaviours associated with Autistic Disorder. Results indicated significant decreases in sensory motor behaviours, sensory responses, language concerns, and total autistic behaviours. In addition, in relation to other classroom observations it was found that there were significantly fewer intervals of not attending in class and significantly more cooperative play. Adaptive behaviour results using the Scales of Independent Behaviour – Revised (Bruininks, Woodcock, Weatherman, & Hill, 1996) indicated significantly increased social interaction and communication. The research concluded that teacher training and the availability of ongoing support was an important component in supporting students with an Autistic Disorder in mainstream primary schools.

Although some aspects of the ABCD Model evaluated by Ikeda et al. (2002) were found to be helpful, analysis of the model showed that it was not adequate in giving schools clear guidelines to follow when supporting the inclusion of a student with an ASD. In addition, although functional analysis of student behaviour and encouragement of peer-mediated social interaction was encouraged, the ABCD Model included a relatively limited range of domains of student functioning to be supported.

Two models have been proposed which the writer considers have given helpful guidelines for facilitating the inclusion of students with an ASD in mainstream settings. One model has been proposed by Kunce (2003) and is called

"An Integrative Model of Effective Educational Intervention". The other model was originally presented by Myles and Simpson (1998) as the Autism Inclusion Collaboration Model. This model has been presented in a revised form by Simpson, de Boer-Ott, and Myles (2003) and is called the "Autism Spectrum Disorder Inclusion Collaboration Model". Both Kunce and Simpson et al.'s models draw on the type of interventions deemed to be effective as outlined in the reviews of effective early educational practices. Kunce's model also draws heavily on her training and work with Division TEACCH. Her model is, thus, comprehensive in scope and soundly based in *structured* educational interventions. The underpinning of Simpson et al.'s model is *collaboration.* These two models overlap in many features and some of their non-overlapping features are complementary. Each of these two models will be described in some detail.

Kunce's "Integrative Model of Effective Educational Intervention"

As outlined in the preceding chapter, Kunce (2003) has pointed out that the range of difficulties associated with ASDs can often be mismatched with the demands of a mainstream school environment. She believes that two implications arising from this for students with an ASD are that (a) intervention needs to target multiple domains of student functioning, and (b) the natural focus of changing *student* behaviour must be balanced by an emphasis on changing the *classroom* environment in order to make it more meaningful for students (p. 247).

Firstly, then, in order to address multiple domains of functioning, the educational program for the student needs to be comprehensive. Others, too, have made this point (Jordan, 2005; Kunce, 2003; Prior, 2003c). In order to be comprehensive, it may also be that schools will utilise a number of cognitive and behavioural intervention practices that have a good evidence base.

Secondly, though, comprehensive support of the student needs to incorporate structural support for the student. This is the distinctive feature of any program based on TEACCH principles because priority is given to environmental modification and supports that are aimed at compensating for the student's learning and behavioural differences.

Kunce's (2003) model proposes putting in place, firstly, foundational elements (viz., whole school structural support, parental collaboration, and assessment), secondly, a meaningful educational plan, thirdly, structural elements across multiple domains of student functioning, and fourthly, curricular elements that are also targeted across multiple domains of functioning. The goal of all of these elements is student outcomes. In explaining the elements of the model, Kunce gives suggestions about a range of well researched structural and curricular interventions that offer helpful guidance.

The model is schematised in Fig. 4.1. The arrows in the model illustrate pathways along which the elements are thought to influence one another. In particular, the structural elements support the functioning of the student by compensating for the student's functioning deficits in cognitive-organisational skills, social communication, and behavioural and emotional areas. These structural elements are thus given priority to increase a student's capacity to access learning. For example, a highly anxious or unhappy student will not be able to focus on other learning being presented. However, Kunce (2003) also
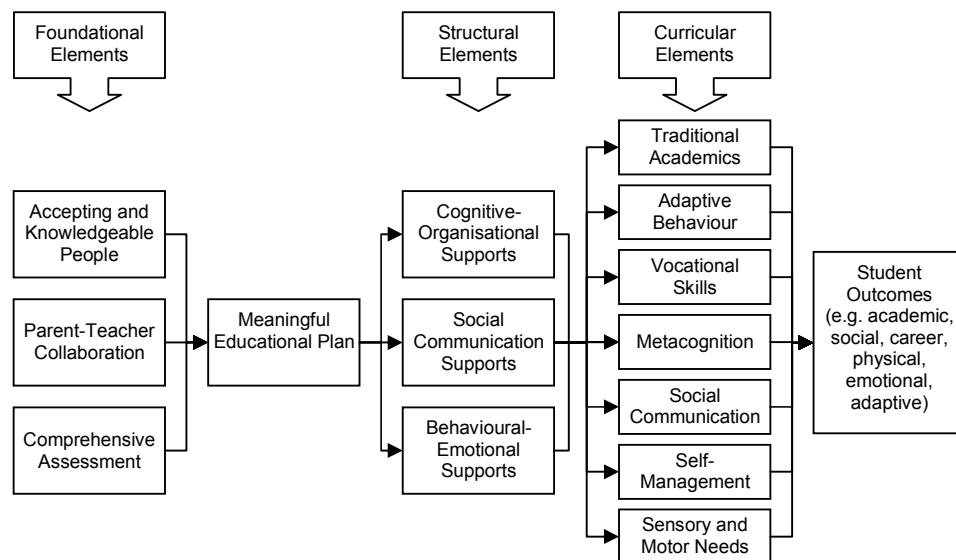
Figure 4.1. Kunce's "Integrative Model of Effective Educational Intervention" [From "The Ideal Classroom," by L. J. Kunce, in *Learning and Behaviour Problems in Asperger Syndrome* (p. 248), ed. M. Prior, 2003, New York: The Guilford Press.]

recognises that in practice there may well be more fluidity in the way the model works and that one may move forwards and backwards across the elements and the domains within the elements, as need arises.

Kunce's (2003) model has application to any student with an ASD but she also explains that she was particularly aware of the needs of the higher functioning students within the autistic spectrum who are likely to be in a mainstream setting. Kunce also makes it clear that although her model has general applicability to all students with an ASD, the application of the model is always intended to be in relation to an individual student, given the degree of difference between individuals who have an ASD.

Foundational Elements

The foundational elements are the essential groundwork that needs to be put in place before other supports can be put in place. Without the foundational elements a school community may not have the will to make the "culture shift" that is necessary to move toward inclusive practices.

Accepting and knowledgeable people

The first foundational element is accepting and knowledgeable people in the school community. For Kunce (2003) what underpins this element is respect for the student. She recognises the need for classroom teachers to receive ongoing education and support about ASDs and knowledge about the particular students with an ASD in their classroom. She also recognises (as do Simpson et al., 2003) the need for acceptance and knowledge by all of the school community, which includes administrative staff, teacher's aides, school secretaries, gardeners, etc. and the student's peers. The reason for this is that all people in a school community may have involvement with a particular student, though they may have varying degrees of involvement. For example, each staff member requires additional understanding and knowledge of a student if an incident arises in a corridor, in the playground, on an excursion, or in another situation in which they are one of the staff members, or the only staff member, involved. This view recognises that many people participate in the life of a school community. All of

the school community does not need the same level of understanding of ASDs but all participants in a school community require some understanding. Kunce (2003) also notes the particular role that the classroom teacher plays in educating the student's peers about disability, as well as in modelling acceptance of the student with an ASD to other students.

Parent-teacher collaboration

The second foundational element of Kunce's (2003) model is ongoing parent-teacher collaboration and communication. (This element is also stressed in Simpson et al.'s 2003 model). For Kunce this element is based on the intervention principles practised by TEACCH in which a working relationship with parents is seen as fundamental to effective intervention. Parent involvement is seen as important because parents can be helpful in giving informative assessment information, in devising treatment plans, and in supporting the implementation of plans (Kunce, 2003; Kunce & Mesibov, 1998). Parents are recognised as having known the child for the longest period of time and therefore as being "the best experts on their children" (Kunce, 2003, p. 251). In addition, it is recognised that parents will have the longest ongoing involvement with their child and need to be involved in processes involving their child along the way (Kunce, 2003).

Comprehensive assessment

The third foundational element of Kunce's (2003) model is comprehensive assessment of the student. The purpose of wide-ranging assessment is to understand a particular student's profile of strengths and weaknesses. This understanding can then be used in setting learning goals for the student in the form of a meaningful education plan. The process of assessment will need to be ongoing in terms of monitoring progress and setting new learning goals.

The model proposes that assessment would include an understanding of the student's cognitive abilities, language abilities, and current academic level. As well, assessment would include an understanding of the student's social and emotional abilities, adaptive skills, particular sensory differences, and behavioural difficulties. With regard to the basis for this assessment, the model proposes that

information would need to be obtained from a range of sources and gathered through both formal and informal assessments. Assessment may include, for example, finding out about triggers causing an escalation in anxiety from a range of sources such as teachers, parents, and professionals who have been working with the student.

Meaningful Education Plan

All of the foundational elements contribute to the formulation of the student's meaningful education plan, as shown by the arrow in Fig. 4.1. In this plan the student's learning goals are set out, as well as the strategies to attain these goals and the people and/or resources that will be used. Kunce (2003) emphasises that too often educational plans are not truly meaningful for the student. This point has also been made by others (Fouse, 1999). Kunce believes that wide ranging formal and informal assessment that gives a detailed understanding of the student should be used in the formulation of more meaningful educational goals. Kunce also mentions that a primary coordinator or case manager is identified in the plan.

Structural Elements

The second key set of elements that Kunce's (2003) model suggests are the structural elements necessary in the overall plan for a particular student. These elements are the infrastructure that is necessary for the educational program to be effective. As already mentioned, these elements are put in place prior to curricular elements in order to increase the student's capacity to access learning. The model recognises the needs for structural supports in three overlapping areas. These are cognitive-organisational supports, social-communication supports and behavioural -emotional supports.

Cognitive-organisational supports

The cognitive deficits in an individual with an ASD have already been outlined in relation to executive functioning and weak central coherence. Kunce

(2003) emphasises the importance of using structural supports in the learning environment to help compensate for difficulties such as these.

Kunce (2003) identifies the cognitive deficits of students with an ASD in terms of "organising their responses, identifying relevant information in assignments, managing time, and understanding complex language" (p. 254). Kunce and others have recognised the benefits of structured environments and structured teaching (Ozonoff, 1998; Ozonoff & Miller, 1995; Schopler et al., 1995). Kunce believes that these weaknesses in the student can be compensated for by building on learning strengths and by building more predictability and meaningfulness into the school environment. This can be facilitated through using routines, creating a visually organised classroom, using schedules, and communicating work expectations visually and explicitly.

Social communication supports

Social communication supports are also included in the structural elements in Kunce's (2003) model. Difficulty in social communication is a core deficit of students who have an ASD and involves both the language difficulties of an individual with an ASD and their cognitive deficit in relation to theory of mind. This deficit in social communication can be less obvious in students at the higher end of the spectrum who appear more able in terms of language facility, but all students with an ASD require support in social communication. Kunce notes that providing this support will require changing aspects of the school's social communication environment. This may mean that teachers will need to learn more about how to communicate with students more effectively. This may include using shorter statements, addressing a student by using his or her name prior to an instruction so that he or she clearly knows he or she is being addressed, being careful to be concrete, and not using figurative language. In addition, social communication structuring may mean providing a range of other supports, such as role playing appropriate social interchanges, explicit teaching in terms of social stories, and cartooning in order to clarify the rules in social engagements. As well, opportunities for students to engage socially in small groups with adult support, or

other opportunities for students to build social communication learning, may be beneficial.

Behavioural-emotional supports

The third structural element in Kunce's (2003) model involves behavioural-emotional supports. Structuring the environment in relation to a student's cognitive-organisational and social communication difficulties may also provide behavioural and emotional support that the student may require. In addition, Kunce proposes providing specific behavioural-emotional support within the school environment through such measures as identifying for the student a safe person to whom they can go whenever necessary, and through such strategies as scheduling take-a-break time to support the student prior to the escalation of negative behaviours.

Curricular Elements

The third key set of elements of Kunce's (2003) model focuses on the curricular content of the education plan. She proposes a broad educational plan that includes not only traditional academic curricula but also other areas. The need to focus educationally on a wider curriculum content is necessary because of the multiple associated impairments of a student with an ASD.

Traditional academics

The first curricular element is traditional academic curricula. Kunce's (2003) model understands that the need to modify the teaching of traditional academic curricula will vary from student to student. However, frequently, traditional academic curricula will need to be modified to compensate for weaknesses associated with an ASD. For example, problems in understanding language literally and in understanding social interactions may lead to difficulties in reading comprehension. As well, other difficulties may occur in relation to executive functioning skills, such as helping students with an ASD organize and sequence their ideas in a written task. It is also not uncommon for students with an ASD to have a Specific Learning Disability in particular academic areas. This

may include significant difficulties in one or more of the following areas of literacy: reading, reading comprehension, spelling, or the composition of written texts. In addition, some students with an ASD may have difficulty with the fine motor task of writing. In all of these areas of specific difficulty, various curricular supports will be required, along with flexible adaptation and modification of work requirements.

Kunce (2003) strongly encourages that within traditional academic curricula, teachers incorporate and develop the student's special interests and abilities. This too will require curriculum planning.

Adaptive behaviour

The second curricular element in Kunce's (2003) model is adaptive behaviour. The inclusion of this element recognises that students with an ASD require curricular support in developing adaptive behaviour skills (e.g., daily living skills such as personal care, basic safety, and community functioning). There will be individual differences in the particular level from which skills will need to be developed (as in other areas). Kunce emphasises that part of developing these skills will involve being explicitly taught these skills and practising them in other environments in order that the skill is generalised.

Vocational skills

The third of the curricular elements in Kunce's (2003) model is vocational skills. The inclusion of this element acknowledges the importance of preparing students in relation to their future vocations. This element's relevance increases as students become older, but Kunce recognises the importance of this element throughout schooling. This is also recognised by others in the field (Howlin, 1998, 2003). Even in primary school giving students responsibility to an appropriate level can be seen as preparation for later employment.

Meta-cognition

The fourth curricular element in Kunce's (2003) model is meta-cognition. Meta-cognition refers to thinking and learning strategies. Kunce points out that in

the autism literature these strategies have been referred to in other ways. They have also been referred to as flexibility training, cognitive-behavioural strategies, or in other terms (Jordan & Powell, 1995; Quinn, Swaggart, & Myles, 1994). Kunce refers to specific curricular content in this domain as including the development of concrete ways to help students learn how to select an appropriate problem-solving strategy, helping them to develop more flexible problem-solving strategies, and helping them to understand abstract language.

Social communication

The fifth curricular element in Kunce's (2003) model is social communication. As already noted, difficulty in social communication is a core deficit for students with an ASD, and so clearly needs to be addressed in the curricular elements. In this area Kunce recognises the importance of consultation with a speech pathologist. Although she realises that there is currently no single identified way of addressing social communication needs, she points out that it is highly likely that the curriculum will need to include support in developing friendship skills, conversational skills, and social problem-solving strategies, and in understanding emotions and mental states. Suggestions about how to work in these areas have been made by researchers knowledgeable in the field (Attwood, 2000; Landa, 2000). Kunce also points to the variety of ways in which authors have suggested that teaching in these areas can be addressed through additional individual or small group support, as well as through activities using board games, and computer programs (Attwood, 2000; Beardon, Parsons, & Neale, 2001). Kunce (2003) also points to a program utilising peer and parental support which has been helpful in addressing difficulties in social communication (Bauminger, 2002).

Self-management

The sixth curricular element is self-management. This element involves helping students develop skills in regulating their emotions and in monitoring their behaviour. Kunce (2003) recognises that in this domain additional individual professional support may be necessary for students. However, she also gives

examples of classroom strategies, such as helping students to label feelings, helping students to self-monitor, and helping students to develop coping strategies.

Sensory and motor needs

The final curricular element in Kunce's (2003) model is sensory and motor needs. She recognises that hypo- and hypersensitivities can occur for students with an ASD and that these frequently lead to problem behaviour. Kunce believes that understanding sensory triggers is an important part of classroom intervention, so that these triggers can be avoided or at least minimised. She also recognises that students with an ASD commonly have some gross and/or fine motor difficulties. If students have sensory and/or motor needs, it is possible that these needs could be supported as part of the curriculum through occupational therapy. A program of occupational therapy could be implemented in the school by an occupational therapist or, in consultation with an occupational therapist, by a teacher or teacher aide in the classroom or in a small group.

Student Outcomes

For Kunce (2003), the goal of the model is student outcomes and these outcomes are defined in terms of functioning in multiple domains, such as academic, social, physical, emotional, and adaptive domains, and in the long-term, in terms of career.

Simpson, de Boer-Ott, and Myles' "Autism Spectrum Disorder Inclusion Collaboration Model"

The second model which the writer considers has given helpful guidelines for facilitating the inclusion of students with an ASD in mainstream schools is Simpson, de Boer-Ott, and Myles' (2003) "Autism Spectrum Disorder Inclusion Collaboration Model". Much of this model is similar to Kunce's (2003) model. This indicates that researchers have been coming to agreement about the sort of interventions thought to be supportive of students with an ASD. Simpson et al.'s model will also be outlined in order to emphasise the points of agreement between

the two models and to highlight that Simpson et al.'s model emphasises collaborative problem-solving relationships between all parties involved with a student. The elements of the model are set out diagrammatically in Fig 4.2. This figure shows that collaboration is central to the model.

Simpson et al. (2003) make it clear that the underpinning of their model is collaboration. They emphasise that collaboration needs to occur between the classroom teacher, special educators, other support personnel, and parents. In emphasising this, they stress that there is to be equal status among team members and that mutual problem-solving is the aim of all collaborative consultation. In this model collaborative practice is not based on one person telling another person what to do.

The model also outlines in detail what this means in terms of various relationships. With regard to the relationships between teachers and other professionals, Simpson et al. (2003) write:

Although educators vary in their desire for "expert advice", it is our experience that collaborative consultation is the most efficient and effective means of supporting general education teachers working with
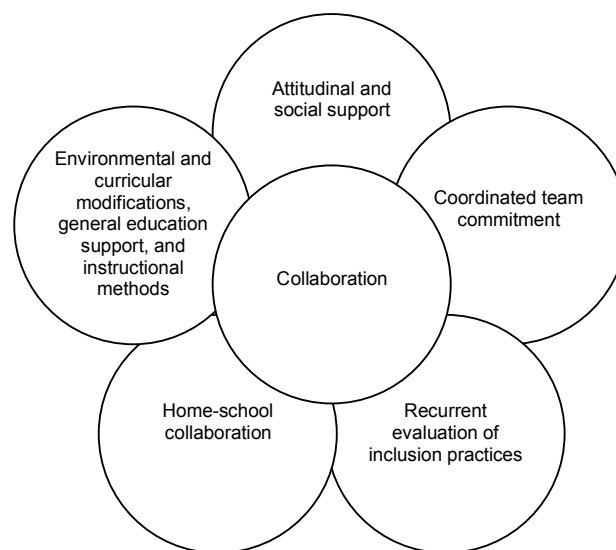
Figure 4.2. Simpson, de Boer-Ott, and Myles' "Autism Spectrum Disorder Inclusion Collaboration Model" [From "Inclusion of Learners with Autism Spectrum Disorders in General Education Settings," by R. L. Simpson, S. R. de Boer-Ott, and B. S. Myles, 2003, *Topics in Language Disorders, 23* (2), p. 118].

students with ASD, and preparing them to generalise and sustain problem solving programs learned in collaborative relationships. (p.119)

That is, collaborative consultation has led to more success in terms of teachers actually implementing new strategies and in terms of teachers' ongoing use of strategies. They also stress that not only teachers and other professionals but also parents need to be involved in the collaborative process. They recognise the value of the meaningful participation of parents in educational planning and decision making.

Collaboration is also an important value in Kunce's (2003) model but, following TEACCH principles, she refers more to the importance of ongoing collaboration between parents and teachers than to the relationship between the teacher, parent, and professionals. Kunce also recognises the value of input and support from professionals from multiple disciplines, but Simpson et al. (2003) emphasise the collaborative nature of the relationship between all of these parties and the importance of equal status among all of these parties. This means that specialists may suggest ideas, but discussion between all parties will modify and shape decisions about what is to be implemented. Simpson et al. emphasise shared responsibility and shared decision making among all parties. The aim of this process is that the teacher will implement the intervention that is decided upon because they have been involved in shaping it.

Simpson et al.'s (2003) model contains five major components.

Environmental and Curricular Modifications, General Education Classroom Support, and Instructional Methods

The first component involves environmental and curricular modifications, general education classroom support, and instructional methods. With regard to the implementation of this component, Simpson et al. (2003) highlight the need for appropriately trained support service staff from various disciplines as well as in-service training for classroom teachers, special needs teachers, and teacher aides. Simpson et al. also point to the need for continuous support and ongoing education for teachers to accompany training programs. They envisage that this would need to be both in a group and individually based for teachers and they

explicitly state that 'one-shot' training workshops are rarely effective (Simpson et al., 2003, p. 119). Kunce (2003) also mentions the importance of ongoing support for teachers.

The importance of the implementation of appropriate instructional methods for students with an ASD is also emphasised in this component of Simpson et al.'s (2003) model, along with the need for adequate teacher planning time, reduced class size, and increased availability of teacher aides.

Attitudinal and Social Support

The second component in Simpson et al.'s (2003) model is attitudinal and social support. Simpson et al. emphasise that inclusion cannot occur without a strong attempt by administrators, teachers, parents, and students to create an accepting environment. They believe that the development of positive attitudes in a school community requires providing staff with information about ASDs and, as permitted, with information about individual students with an ASD. They also believe that the development of positive attitudes in a school community requires permission to discuss roles, attitudes and feelings. In addition, they suggest that the fostering of peer attitudes needs to be actively encouraged. This component of their model is similar to Kunce's (2003) proposal that a foundational element of effective educational intervention is that there are accepting and knowledgeable people in the school community.

Coordinated Team Commitment

The third component in Simpson et al.'s (2003) model is coordinated team commitment. Simpson et al. recognise that historically there seems to have been a divide between special education and general education. They point to the need for a closer working relationship between general educators and special educators in order that expertise can be shared and that shared responsibility and shared decision making can be facilitated. Special education includes special needs teachers in schools and teachers in special education settings. This component is not specifically elucidated by Kunce (2003), but she does envisage cooperation of other professionals with the core parent-teacher collaborative unit.

Recurrent Evaluation of Inclusion Practices

The fourth component in Simpson et al.'s (2003) model is the recurrent evaluation of whether or not the process of inclusion is of benefit to the particular student. Simpson et al. recognise, as does Kunce (2003), the importance of assessment in order to plan instructional strategies, to set learning goals, and to evaluate the student's progress, but Kunce outlines more fully the breadth of student functioning to be assessed.

Recurrent evaluation for Simpson et al. (2003) also includes the need to ask two key questions in the process of evaluating outcomes. These questions are whether the student is benefiting socially from the general education environment, and whether the student is benefiting academically from the general education experience. In addition, assuming that appropriate and adequate support is in place for the student, Simpson et al. also suggest that it needs to be asked whether the student is demonstrating appropriate participation within the general education environment and is not harming other students.

Home-School Collaboration

The final component of Simpson et al.'s (2003) model is home-school collaboration. This component emphasises, as does Kunce (2003), that meaningful participation of parents in ongoing educational planning, decision making, and implementation is essential to an effective program of inclusion. Simpson et al. emphasise the importance of mutual trust between parents and the school. They also emphasise that the relationship between parents and the school community needs to move beyond policy requirements. They stress the importance of the school having a "willingness to listen" and being accepting of parents' "individual values" in the partnership relationship that it establishes with parents (Simpson et al., 2003, p. 128).

The Proposed Model of Support to be Implemented

The writer sought to implement and evaluate a model of support for students with an ASD in mainstream primary schools that was based on both Kunce's (2003) model and Simpson et al.'s (2003) model. This research model is

based on Kunce's model in that it outlines sequential elements to be put in place in supporting these students. Importantly, the fundamental belief outlined in Kunce about the necessity to put in place structural elements prior to curriculum elements is embraced in the research model. The research model is based on Simpson et al.'s model in that the exact shape of the interventions undertaken for each student is decided upon collaboratively by teachers, parents, an autism consultant, and other supportive consultants. The insights of "good evidence-based practice", mentioned in both Kunce's and Simpson et al.'s models, formed the knowledge base that was taught to teachers in initial training and in an ongoing way as possible interventions for the student were discussed.

In brief, the emphases of the research model were:

1. Education of all the staff of a school about ASDs, and facilitation of their understanding that support of a particular student with an ASD in the school involved all of them to some extent.

2. Additional training and ongoing support for the teacher and the parent(s) of the student who was being supported.

3. Putting in place *structural* interventions which supported the student across multiple domains of functioning before putting in place curricular interventions.

4. *Collaborative* planning of support for the student involving an autism consultant, the student's teacher, and the student's parent(s).

Kunce (2003) recognised that her model did not explicitly address the question of the availability of resources to implement the model. She contended that the recommended strategies could be implemented in regular classrooms with largely inexpensive technology but she also recognised that the implementation of her model required substantial human resources. The availability of human resources is an important consideration in the implementation of any model. In the research model an autism consultant who is knowledgeable in the area of ASDs is provided as an additional human resource. The autism consultant brings together the student's teacher, teacher aide (if allocated), special needs teacher (if allocated), and parent(s), and facilitates additional training and support for them in relation to interventions. The autism consultant also facilitates linkage and

briefing of appropriate school support staff (e.g. Education Department psychologists and speech pathologists) who have responsibility in the school the student attends. As necessary, these school support staff and other support specialists are encouraged to participate in the collaborative planning of support for the student.

The research model is outlined in Figure 4.3. There are only minor differences between this figure and Fig. 4.1 which outlines Kunce's (2003) model. This reflects that there are only minor differences between the research model and Kunce's (2003) model, and these differences will be noted in the following description of the research model.
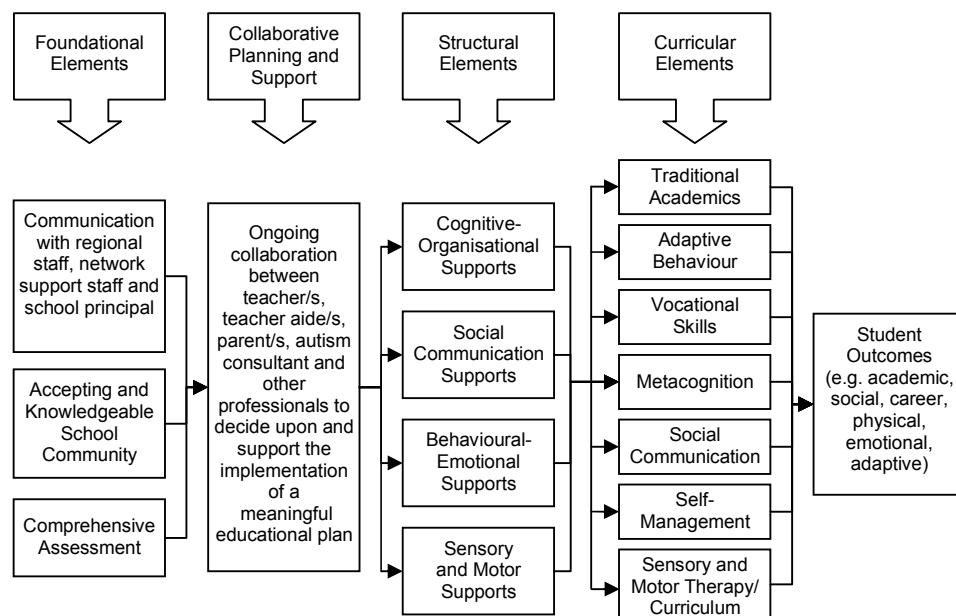
Figure 4.3. The structured and collaborative model used in the research.

Foundational Elements

There are three foundational elements in the research model that are considered to be essential groundwork.

Communication with regional staff, network support staff and school principals

The first foundational element in the research model is communication by the autism consultant with regional staff, network support staff, and school principals. This foundational element in the research model is not given as a foundational element in Kunce's model but the writer considered that this is essential groundwork in terms of ensuring acceptance of the research model and in terms of laying a foundation for collaboration. Communication with regional staff and network support staff also opens up the possibility of utilising their expertise. As well, communication with network support staff establishes that the intent of the implementation of the research model is to be supportive of their work in schools and to work together where possible. Communication with school principals makes clear that the implementation of the research model has a whole school emphasis, as well as an emphasis on supporting individual students with an ASD and supporting these students' teachers and teacher aides (if allocated).

Accepting and knowledgeable school community

The second foundational element in the research model is an accepting and knowledgeable school community. This foundational element is identical to the first foundational element in Kunce's (2003) model, except that it is referred to as *accepting and knowledgeable school community* rather than *accepting and knowledgeable people*. In the research model it is proposed that this knowledge is built through whole staff training and additional training for staff who had a student with an ASD in their class.

Comprehensive assessment

The third foundational element in the research model is comprehensive assessment. This element is identical to the third foundational element in Kunce's (2003) model.

Collaborative Planning and Support

The core element of the research model is collaborative planning and support. This element corresponds to the element in Kunce's (2003) model referred to as *meaningful education plan* but incorporates the second foundational element of Kunce's model, namely, parent-teacher collaboration, and specifies that there is to be ongoing collaboration between teacher/s, teacher aide/s, parent/s, autism consultant, and other professionals to decide upon and support the implementation of a meaningful educational plan. This collaboration is to be organised by the autism consultant and involves regular meetings of the participating teacher/s, teacher aide/s, parent/s, and autism consultant. The participation of other professionals is facilitated when necessary. The essential ethos of these meetings is collaboration.

Collaboration is understood to be an interaction between two or more equal parties who each have particular areas of expertise and who each share in decision making (Kampwirth, 2003; Simpson et al., 2003). Collaborative consultation has been discussed in the literature as an effective practice in schools (Kampwirth, 2003). It has been found that collaboration leads to more success in terms of teachers actually implementing new strategies and continuing to use strategies (Klinger, Arguelles, Hughes, & Vaughn, 2001; Simpson et al., 2003).

In this research model, teacher/s, teacher aide/s, parent/s, autism consultant and other professionals collaboratively decide upon the student's meaningful education plan. Deciding upon this plan involves setting goals and designing workable interventions and builds on the staff training that has taken place, as well as on the comprehensive assessment of the student. Doing this collaboratively involves mutual problem solving. Particular interventions are not planned by the autism consultant and given to the teacher in terms of a top-down expert-to-teacher model in which one person tells another person what to do. Collaboration ensures that interventions are not imposed on teachers but rather that teachers experience more ownership in relation to the particular interventions that have been decided upon.

In addition, teacher/s, teacher aide/s, parent/s, autism consultant and other professionals collaboratively support the implementation of the plan which has

been decided upon. In particular, they make decisions about how they can support the student's teacher in implementing particular interventions.

Structural Elements

The first three structural elements in the research model are identical to the three structural elements in Kunce's (2003) model. These three structural elements are cognitive-organisational supports, social communication supports, and behavioural-emotional supports. However, in the research model, sensory and motor supports are added as a structural element. This is done on the assumption that structural modifications may need to be made to the school environment to support a student's sensory difference and motor difficulties.

Curricular Elements

The first six curricular elements in the research model are identical to the first six curricular elements in Kunce's (2003) model. These six curricular elements are traditional academic curricula, adaptive behaviour, vocational skills, meta-cognition, social communication, and self-management. However, because sensory and motor supports are included in the research model as a structural element, the seventh curricular element in the research model which relates to sensory and motor needs corresponds to only part of the seventh curricular element in Kunce's model which relates to sensory and motor needs. Accordingly, the seventh curricular element in the research model is referred to as *sensory and motor therapy/curriculum*. This emphasises that curriculum as well as school structures can address the sensory and motor needs of the student. For example, sensory motor integration programs and other occupational therapy support may be a beneficial addition to curriculum. In addition, the classroom teacher (or teacher aide) may implement programs in the classroom given to them by the occupational therapist.

Student Outcomes

The goal of the research model is student outcomes and this goal is identical to the goal of Kunce's (2003) model.

Research Aims and Hypotheses

The primary aim of the present research was to evaluate the effectiveness of the implementation of the research model. Analysis was undertaken with the following aims:

1. To evaluate experimentally the effect on the autistic behaviours of students with an Autism Spectrum Disorder.

2. To evaluate the change in the executive functioning ability of students with an Autism Spectrum Disorder.

3. To evaluate the change in problem behaviours of students with an Autism Spectrum Disorder.

4. To evaluate the benefits for the teachers and parents of the students with an Autism Spectrum Disorder who participated in the implementation of the research model.

It was hypothesised that the students with an Autism Spectrum Disorder who were the focus of the research model would demonstrate a greater decrease in autistic behaviours than the students with an Autism Spectrum Disorder who were not the focus of the research model.

It was hypothesised that the students with an Autism Spectrum Disorder who were the focus of the research model would demonstrate an improvement in executive functioning ability in the classroom.

It was hypothesised that the students with an Autism Spectrum Disorder who were the focus of the research model would demonstrate a decrease in problem behaviours.

It was hypothesised that the teachers involved in the implementation of the research model would report that their knowledge had increased and that the process had been of benefit to them.

It was also hypothesised that the parents involved in the implementation of the research model would report that their knowledge had increased and that the process had been of benefit to them.

The secondary aim of the research was to gain information regarding the profile of students with an Autism Spectrum Disorder. This information was gained by the analysis of the results of a range of assessments of each student in the sample. Analysis was also undertaken in regard to the profiles of the students in each of three autistic diagnostic categories, namely, Autistic Disorder, Asperger's Disorder, and ASD-NOS.

CHAPTER 5

RESEARCH METHOD

Participants

Student Participants

The research model was implemented with regard to a sample of eighteen children with an ASD. Each of these children had previously received a diagnosis which indicated that he or she had an ASD. However, the diagnosis had been made in a variety of ways by a number of different professionals. Verification that each of these children had an ASD was undertaken by the writer using the Diagnostic Interview for Social and Communication Disorders (DISCO; Wing, 1994). The writer had been trained and supervised in the use of the DISCO by an accredited trainer in the DISCO assessment tool. The writer interviewed one of each of these children's parents using the DISCO and examined the parent's responses according to the algorithm for Autistic Spectrum Disorder in the DISCO manual (see Appendix B). This algorithm was formulated on the basis of Wing and Gould's (1979) criteria. Each of the eighteen children satisfied the diagnostic criteria in this algorithm and so was verified to have an Autism Spectrum Disorder.

These eighteen children were between 5 and 12 years of age and were students in Preparatory Grade to Grade 6 in nine different regional or rural mainstream government schools in the Corangamite District and the Warrnambool district of the Barwon South Western Region of the Victorian Department of Education and Training (now known as the Department of Education and Early Childhood Development). This region is in south west Victoria, Australia. Fifteen of these children were boys and three were girls. All were Australian born.

Allocation of Student Participants Into Matched Groups

The students in the sample were divided into two groups of nine students ($n = 9$ in each group). The research model was implemented with regard to each

of these two groups in two successive periods. In what follows the implementation of the research model with regard to each group will be referred to as *the intervention* and the two successive periods during which the intervention occurred with one group and then with the other group will be referred to as *the first and second intervention periods*.

A broad attempt was made to match the two groups according to the students' year levels at school. Matching according to year level was based on two broad bands. Band 1 included students in Preparatory Grade to Grade 2. Band 2 included students in Grade 3 to Grade 6. After placing the students in these broad bands, they were allocated to Group One or Group Two using stratified random sampling. There were two constraining factors, though, in allocation. One was that there could not be an overlap of schools across the two groups. An overlap of schools was not possible because part of the intervention for each student involved education for all of the school staff in that particular student's school. To have had this part of the intervention in a particular school in both intervention periods would have been a confounding factor. An additional constraining factor was that one teacher was not available in the first intervention period due to being on leave. What occurred was that random allocations were made and two reallocations to the other group needed to be made due to these two constraining factors.

After students were allocated in this way a check was also made that the groups were matched relatively well according to gender. It was found that there were eight boys and one girl in Group One and seven boys and two girls in Group Two. That is, the two groups were as well matched as possible in terms of gender. The students in Group One were in six schools and the students in Group Two were in three schools. The grade levels and gender of the students in Group One and Group Two are set out in Table 5.1.

It was not possible to match the groups on other factors such as intellectual ability, specific autistic diagnosis, language functioning, and severity of Autism Spectrum Disorder, although information about all of these factors was obtained to gain additional knowledge about the students. All of this information was

Table 5.1

Grade Level and Gender of Group One and Group Two Students

Grade	No. of students in Group One	No. of students in Group Two
Preparatory	2[a]	1
Grade 1	2	2[a]
Grade 2	0	1
Grade 3	2	2[a]
Grade 4	2	1
Grade 5	0	2
Grade 6	1	0

[a] One of these two students is a female student

considered important in terms of deciding on meaningful education plans for the students.

Age of Student Participants

At the start of the first intervention period the mean age of Group One students was 102.44 months ($SD = 27.94$) and the mean age of Group Two students was 104.33 months ($SD = 25.06$). An independent samples t test was undertaken to ascertain if there was a significant difference between groups in terms of age. The assumption of homogeneity of variance was not violated and the result indicated that the groups were not significantly different, $t(16) = -.15$, $p = .88$.

Intellectual Ability of Student Participants

The intellectual ability of the students in the sample was assessed using the age-appropriate Wechsler intelligence test. The tests used were either the Wechsler Preschool and Primary Scale of Intelligence – Third Edition (WPPSI-III; Wechsler, 2004) or the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler, 2003). Five students had been assessed using a Wechsler intelligence test in the year prior to the interventions by psychologists

within the Department of Education and Training and the results of these assessments were used in the interventions. The other thirteen students involved in the interventions were assessed by the writer. Verbal Comprehension Index scores (termed Verbal IQ scores in the WPPSI-III), Perceptual Reasoning Index scores (termed Performance IQ scores in the WPPSI-III), and Full Scale IQ scores were obtained for all eighteen students. Descriptive statistics of the scores of Group One and Group Two students are set out in Table 5.2.

Table 5.2

Descriptive Statistics of Wechsler Intelligence Ability Standard Scores of Group One and Group Two Students

Wechsler scale	Group One			Group Two		
	Mean	SD	Range	Mean	SD	Range
Verbal Comprehension Index	88.11	20.64	50 -112	74.78	14.11	47-100
Perceptual Reasoning Index	97.11	11.39	77-109	83.33	20.22	55-115
Full Scale IQ	87.89	14.71	57-104	72.33	19.56	41-111

Independent samples *t* tests were undertaken to ascertain if there were any significant differences between groups in terms of intellectual ability. The assumption of homogeneity of variance was not violated and results indicated that there were no significant differences: Verbal Comprehension Index, t (16) = 1.60, p = .129; Perceptual Reasoning Index, t (16) = 1.78, p = .094; Full Scale IQ, t (16) = 1.91, p = .075.

Autistic Diagnostic Category of Student Participants

As noted previously, all of the students in the sample had previously received a diagnosis that they had an ASD. However, these diagnoses had been given using a variety of diagnostic terms. To standardise the autistic diagnostic categories used to diagnose the students, the writer developed the following process to diagnose the students as having Autistic Disorder, Asperger's Disorder, or ASD-NOS.

Firstly, the parent's DISCO responses were examined according to the algorithm for Childhood Autism in the DISCO manual (see Appendix C). This algorithm was formulated on the basis of the criteria for Childhood Autism in ICD-10 (World Health Organization, 1992, 1993). As stated previously, the DSM-IV-TR term *Autistic Disorder* rather than the ICD-10 term *Childhood Autism* is used in this thesis. Therefore, in the present research, if a student satisfied the criteria in the DISCO algorithm for Childhood Autism, he or she was diagnosed to have Autistic Disorder.

Secondly, the parent's DISCO responses were examined according to the algorithm for Asperger's Syndrome in the DISCO manual (see Appendix D). This algorithm was formulated on the basis of criteria by Wing (1981) and Gillberg and Gillberg (1989) rather than on the basis of the criteria for Asperger's Syndrome in ICD-10. The criteria in the DISCO algorithm include a criterion requiring subtle language problems, whereas the criteria for Asperger's Syndrome in ICD-10 include the criterion of "no clinically significant general delay in language". The criteria in the DISCO algorithm also do not specifically require normal development in cognition, whereas the criteria in ICD-10 include the criterion of "no significant delay in cognitive development". As well, the criteria in the DISCO algorithm do not specifically require normal development in adaptive skills, whereas the criteria in ICD-10 include the criterion of "age appropriate self-help skills [and] adaptive behaviour". In the present research the criteria used were those in the DISCO algorithm except that intellectual disability (i.e., intellectual ability more than two standard deviations below the norm on a standardised test) was added as an exclusionary criterion, in line with the diagnostic criterion related to cognitive development in ICD-10 and DSM-IV-TR. As stated previously, the DSM-IV-TR term *Asperger's Disorder* rather than the ICD-10 term *Asperger's Syndrome* is used in this thesis. Therefore, in the present research, if a student satisfied the criteria for Asperger's Syndrome in the DISCO algorithm and the student did not have an intellectual disability, he or she was diagnosed to have Asperger's Disorder.

Thirdly, in the present research, if a student was not diagnosed to have Autistic Disorder or Asperger's Disorder, then he or she was diagnosed to have

Autism Spectrum Disorder – Not Otherwise Specified. This diagnosis is referred to in this thesis using the acronym ASD-NOS. This group had satisfied the algorithm for ASD but given that they did not satisfy the algorithm for Autistic Disorder or Asperger's Disorder the term ASD-NOS was used to distinguish this group.

Using this process to diagnose the student participants, seven were diagnosed as having Autistic Disorder, seven were diagnosed as having Asperger's Disorder, and four were diagnosed as having ASD-NOS. The autistic diagnostic categories of the students in each group are set out in Table 5.3.

Table 5.3

Autistic Diagnostic Categories of Group One and Group Two Students

Autistic diagnostic category	Group One	Group Two
Autistic Disorder	3	4
Asperger's Disorder	5	2
ASD-NOS[a]	1	3

[a] ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified

With regard to Part 9 of the DISCO (Quality of Social Interaction), all of the students in the sample received a rating of 3 or 4. A rating of 3 indicates that the child does not initiate but responds to social contact if others make approaches. A rating of 4 indicates that the child makes social approaches actively but these approaches are sometimes inappropriate, naïve, or one sided. In Group One, four students received a Quality of Social Interaction rating of 3, and five students a rating of 4. In Group Two, four students received a rating of 3, and five students a rating of 4.

Severity of Autism of Student Participants

The severity of autism of the students in the sample was assessed using the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1988). If this assessment had been undertaken by another psychologist within the year prior to the commencement of the first intervention period then the result of this

assessment was used. Otherwise the students were assessed by the writer. Only one student had a CARS score in the Severely Autistic range. This student was in Group Two. All other students had a CARS score in the Mild to Moderately Autistic range. It was found that Group One students had a mean CARS score of 33.94 ($SD = 1.86$) and that Group Two students had a mean CARS score of 33.94 ($SD = 3.89$). An independent samples t test was undertaken to ascertain if there was a significant difference between groups in terms of severity of autism. The assumption of homogeneity of variance was not violated and the result indicated that there was no significant difference, $t (16) = .00, p = 1.00$.

Student Participants with Student Support Groups

At the time of the interventions in 2006, six of the eighteen students in the sample were funded through the Program for Students with Disabilities (Department of Education and Training, 2006c). Two of these students were in Group One and four were in Group Two. The precise criteria under which these six students were deemed eligible to be funded through this Program were not known, but Kidman (2006) indicated that the State Education Data Base for 2006 identified that there were six students with ASD on the Program for Students with Disabilities in primary schools in the Corangamite and Warrnambool districts (p. 69).

The six students in the sample who were funded through the Program for Students with Disabilities each had a Student Support Group which involved meetings with parents to establish an individual education plan and to evaluate progress. Only five of the other twelve students in the sample were supported in this way through the special needs support provided at the school. This meant that seven students in the sample had no additional support structure in place before the interventions despite them having received a diagnosis that they had an ASD.

In terms of the writer's diagnoses of the students in the sample, five of the students who were funded through the Program for Students with Disabilities had Autistic Disorder and one of them had Asperger's Disorder. The student with Asperger's Disorder had severe pragmatic language deficit and aggressive behavioural difficulties at preschool.

Two of the seven students in the sample with Autistic Disorder were not funded through the Program for Students with Disabilities. One of these students had only recently been diagnosed with Autistic Disorder and an application for funding was to be made for that student for the following year. An application had been made for the other student with Autistic Disorder but that application had been unsuccessful on the basis of his receptive and expressive language functioning being slightly above the requirement for eligibility. However, it was also the case that for both of these students with Autistic Disorder who were not funded through the Program for Students with Disabilities, their schools had been so concerned that they would manage that they had put in place some teacher aide support which was funded through the school's global budget. A Student Support Group had been put in place for one of these students but not for the other one.

Six of the seven students in the sample with Asperger's Disorder were not funded through the Program for Students with Disabilities. Only one of these six students had a Student Support Group in place at the school and the other five did not.

All of the four students in the sample with ASD-NOS were not funded through the Program for Students with Disabilities. Three of these students had a Student Support Group in place and the other one did not.

To summarise, then, eleven of the eighteen students in the sample had a Student Support Group in place in their school. Five of these students were in Group One and six were in Group Two. These eleven students were six of the seven students with Autistic Disorder, two of the seven students with Asperger's Disorder, and three of the four students with ASD-NOS.

Teacher and Parent Participants

The interventions also involved the participation of the participating students' teachers, teacher aides, and parents. Eighteen classroom teachers (sixteen female and two male) and six teacher aides (all female) were involved. One of the teachers (female) was also the school's special needs teacher. As well, eighteen parents (seventeen mothers and one female guardian) were involved.

Education and Socio-Economic Status of Parents

In order to characterise the education and socio-economic status of the student participants' parents, only the education and occupation of the female parents was considered. This was done, firstly, because these women were directly involved in the interventions and, secondly, because some of these women were sole parents.

With regard to education, all of the female parents had reached an upper secondary school standard of at least Year 10 level. In Group One, two of these women had reached Year 10 level, three had completed Year 12, and four had completed tertiary education. In Group Two, three of these women had reached a Year 10 level, three had completed Year 12, and three had completed tertiary education.

With regard to socio-economic status, each female parent's occupation was rated according to a 100 point Australian occupational categorisation system developed by the Australian National University called the ANU4 Index and outlined by Jones and McMillan (2001). This categorisation system was based on "A Standard International Socio-Economic Index of Occupational Status" (Ganzeboom, De Graaf, & Treinman, 1992). If a female parent was currently solely undertaking home duties, her occupation was taken to be her previous occupation. Using the ANU4 Index the mean score for Group One female parents' occupations was $M = 52.32$ ($SD = 28.83$) and the mean score for Group Two female parents' occupations was $M = 41.77$ ($SD = 27.97$). These scores indicate middle socio-economic status for both groups. An independent samples t test was undertaken to ascertain if there was a significant difference between groups in terms of socio-economic status. The assumption of homogeneity of variance was not violated and the result indicated that there was no significant difference, $t(16) = .79, p = .44$.

Autism Consultant

In the research model the implementation of the model is to be facilitated by an autism consultant who is a professional knowledgeable in the area of ASDs. In the present interventions, the writer was the autism consultant.

Design

Group One was involved in the intervention during the first intervention period (Period 1). Group Two was a wait-control group during Period 1. Although Group Two was not involved in the intervention during this period, the students in this group received the support that they regularly received in their various schools. Group Two was then involved in the intervention during the second intervention period (Period 2). The status of Group One and Group Two during Period 1 and Period 2 is shown in Figure 5.1.

	Group One	Group Two
Period 1	Intervention	Wait control
Period 2		Intervention

Figure 5.1. Status of Group One and Group Two during Period 1 and Period 2.

The effectiveness of the intervention was evaluated by comparing behavioural change for Group One during Period 1 with behavioural change for Group Two during Period 1. This was a between-groups analysis in which Group Two acted as a control group.

The effectiveness of the intervention was also evaluated by using repeated measures to compare behavioural change for Group Two during Period 2 with behavioural change for Group Two during Period 1. This was a within-subjects analysis in which within-subjects variables could be controlled.

Analysis was also undertaken to see if the amount of change for Group One during Period 1 differed from the amount of change for Group Two during Period 2.

With this research design there were two constraining factors in deciding the length of the two intervention periods. The first constraining factor was that the teachers of Group One students needed to have some time to get to know these students. The second constraining factor was that Period 1 and Period 2 needed to be within one school year so that Group Two students had the same teacher for both periods. Taking these two constraining factors into account, Period 1 did not

begin until two and a half months after the beginning of the school year. Periods 1 and 2 were then successive four-month periods and Period 2 ended just before the end of the school year.

Instruments

The Diagnostic Interview for Social and Communication Disorders (DISCO)

The Diagnostic Interview for Social and Communication Disorders (DISCO; Wing, 1994) is an extensive interview with a child's parents. This interview consists of nearly 500 questions and provides details about the child's development and about a wide range of behaviours which have ever or currently been observed from infancy upwards. The diagnosis of a particular social and communication disorder is made on the basis of these details through use of diagnostic algorithms in the DISCO manual.

The strength of the DISCO is that it contains a very large number of items covering specific examples of types of behaviour seen in social and communication disorders from very common to rare (Leekam, Libby, Wing, Gould, & Taylor, 2002). The DISCO was specifically designed this way in order to accommodate the breadth of presentation that is possible in these social and communication disorders.

The following areas are covered:

Part 1. Identifying and Social Data

Part 2. Family Background

Part 3. Pre- Peri- and Postnatal History

Part 4. Medical History

Part 5. Infancy

Part 6. Developmental Skills

Part 7. Repetitive, Stereotyped Activities

Part 8. Maladaptive Behaviour

Part 9. Quality of Social Interaction

Part 10. Psychiatric Disorders and Forensic Problems

Part 11. Psychological Tests.

Part 1 to Part 5 cover background information about the family and the development of the child. Part 6 covers information about gross-motor skills, a range of self-care skills, level of independence, a range of communication skills, memory, social interaction skills with peers and adults, imitation, imagination, visual-manual and spatial skills, and academic skills. Part 7 covers repetitive and stereotyped activities (including sensory responses and emotional responses). Part 8 covers maladaptive behaviours without social awareness (such as tantrums), maladaptive behaviours with social awareness (such as bullying), and sleep disturbance. Part 9 is an estimate by the clinician of the child's quality of social behaviour. Part 10 involves questions that relate to psychiatric disorders and forensic problems.

The research design described in the preceding section of this chapter required two interviews involving the DISCO with Group One parent participants and three interviews involving the DISCO with Group Two parent participants.

In the first interview with participant parents involving the DISCO, all sections of the DISCO were administered except that information was obtained for only one of the sections in Part 10. The section relating to Catatonic Features was used but the other sections relating to Sexual Problems, Psychiatric Conditions, and Legal Problems were omitted. These sections were omitted on the basis of Wing's (1994) DISCO administration information in which she outlined that some questions in the Catatonic Features sub-section may be relevant to younger children, but that the questions in the sections relating to sexual, psychiatric, and legal problems generally only apply to an older or adult population.

In subsequent interviews with parent participants involving the DISCO, the only items in the DISCO that were re-administered were the rated items in which it was recorded whether or not the child *currently* demonstrated a particular behaviour. These items were the items listed in each section in Part 6 (Developmental Skills) as *Abnormalities*, all of the items in Part 7 (Repetitive, Stereotyped Activities) and Part 8 (Maladaptive Behaviour), and all of the items in the section relating to Catatonic Features in Part 10 (Psychiatric Disorders and Forensic Problems). The only items from these parts and sections which were not

re-administered were a few items at the end of some sections that were open ended and asked about *Other* behaviours, and two other items that were retrospective and asked about earlier behaviours. These retrospective items were omitted because they were not relevant when the DISCO was being re-administered. In order to distinguish the full DISCO administered in the first interview from the 187 items in the DISCO that were re-administered in subsequent interviews, these re-administered items will be referred to as the *Rated Disco Items*. The administration of the Rated Disco Items enabled the use of detailed behavioural information concerning current behaviours as a measure of behavioural change.

The Rated Disco Items were divided into 27 sub-domains. Nineteen of these sub-domains were further divided into 5 domains. The eight other sub-domains that were not included in any of the five domains were included in the Total Rated Disco Items. These sub-domains and domains and the number of questions in each are set out in Table 5.4.

For the purposes of the present research, the Rated Disco Items were rated according to a different rating scale to that used in the DISCO. The DISCO (Wing, 1994) generally asks the administrator to rate behaviours according to a three-point scale in which behaviours are rated as *marked*, *minor*, or *no problem*. For the purposes of the present research, the Rated Disco Items were rated according to a four-point scale. This was done to give a finer estimate of behavioural change. The four-point scale used the ratings, *no problem*, *mild abnormality*, *moderate abnormality*, and *severe abnormality*. The adjectives "mild", "moderate", and "severe" are also used in the Childhood Autism Rating Scale (CARS; Schopler et al., 1988). These ratings reverse the direction of the scale with lower scores indicating more normal behaviour and higher scores indicating more severe or frequent behavioural abnormalities and, therefore, higher levels of behavioural abnormality. However, scores should not be compared across sub-domains or domains because different numbers of scored items feed into different sub-domains and different domains.

Wing outlined in the administrator's notes for the DISCO (Wing, 1994) that in determining the severity of a behaviour, it is necessary to take into account

Table 5.4

Number of Questions in the Sub-Domains and Domains of the Rated Disco Items

Domain	Sub-domain	Number of questions
Self-Care	Toilet Training	3
	Feeding	4
	Dressing	3
	Hygiene	4
		14
Communication	Receptive Communication	2
	Expressive Communication	10
	Non-Verbal Communication	6
		18
Social Interaction	Social Interaction With Adults	19
	Social Interaction With Age Peers	10
	Social Play	6
		35
Repetitive, Stereotyped Activities	Stereotyped Movements and Vocalisations	11
	Responses to Proximal Sensory Stimuli	14
	Responses to Auditory Stimuli	3
	Responses to Visual Stimuli	4
	Routines and Resistance to Change	18
	Emotions	8
	Overall Pattern of Chosen Activities	8
		66
Maladaptive Behaviour	Behaviour Without Social Awareness	18
	Behaviour With Social Awareness	3
	Sleep Disturbances	4
		25
Other	Gross Motor Skills	4
	Independence	1
	Memory	1
	Imitation of Actions/Movements	1
	Visuo-Manual and Spatial Skills	3
	Imagination	4
	Pictures, Reading , Writing	7
	Catatonic Features	8
		29
Total Rated Disco Items		187

whether this behaviour is a behaviour that can occur at any time (e.g., echolalia, arm flapping, talking repetitively on a subject), a behaviour that can be diminished or prevented by carer strategies (e.g., faecal smearing prevented by constant supervision and redirection but otherwise would occur), a behaviour that requires specific opportunity to occur (e.g., running away from parents when out, insisting on a particular route), or a behaviour that occurs less frequently but is severe when it does occur (e.g., intense tantrum or harmful physical aggression). It was, therefore, necessary to specify the meanings of the ratings for each of these kinds of behaviours. These specified meanings are set out in Table 5.5.

The score for a child in a particular sub-domain of the Rated Disco Items was weighted if a particular item within that sub-domain was not relevant to that child, in which case it was not possible for that child to be given a rating for that item. For example, in the sub-domain Social Play, question 6 asks if the subject takes part in social activities with age peers (such as at various types of clubs). However, this question is only to be asked if the child is aged 10 years or over. Accordingly, if the child was under 10 years of age, the sub-domain score was weighted.

The score for a child for a particular sub-domain was weighted by adding up all of the ratings for that child for all questions in that sub-domain which were relevant to that child, dividing that sum by the maximum score possible for that child for that sub-domain, and multiplying that quotient by the maximum score possible for that sub-domain.

Inter-rater reliability for the DISCO was ascertained in research by Wing, Leekam, Libby, Gould and Larcombe (2002). They found that, for school-aged children, items almost identical with those used in the Rated Disco Items (referred to in their research as untypical behaviour items) had an inter-rater reliability of 83.4% (Wing et al., 2002, p. 315).

Research has also been undertaken in relation to the use of the algorithm for Childhood Autism and the algorithm for Autistic Spectrum Disorder. Leekam et al. (2002) found that both the Childhood Autism algorithm and the Autistic Spectrum Disorder algorithm had good discriminate validity. The inter-rater

Table 5.5

Meanings of Ratings given for Different Kinds of Behaviours when Using the
Rated Disco Items

Kind of behaviours	Rating of 1 (*No problem*)	Rating of 2 (*Mild abnormality*)	Rating of 3 (*Moderate abnormality*)	Rating of 4 (*Severe abnormality*)
Behaviour that potentially can occur at any time	*Never or almost never occurs*	*Occurs monthly or nearly monthly*	*Occurs weekly or nearly weekly*	*Occurs every day or nearly every day when the subject is not involved with some activity incompatible with the behaviour*
Behaviour that can be diminished or prevented by carer strategies	*Never or almost never occurs*	*Strategy has to be in place weekly or nearly weekly or behaviour would occur*	*Strategy has to be in place monthly or nearly monthly or behaviour would occur*	*Strategy always has to be in place or behaviour would occur*
Behaviour that requires specific opportunity to occur	*Never or almost never occurs, i.e. between 0% and 10% of the time*	*Occasionally occurs when an opportunity arises, i.e. between 10% and 50% of the time*	*Occurs fairly often when opportunity arises, i.e. between 50% and 90% of the time*	*Always or nearly always occurs when opportunity arises, i.e. between 90% and 100% of the time*
Behaviour that occurs less frequently but is severe when it does occur	*Never or almost never occurs*	*Occasionally occurs, carer or others around not vigilant or anxious*	*Occurs fairly often, carer or others around are frequently vigilant or anxious*	*Occurs often, carer or others around are constantly vigilant or anxious*

reliability was also high for both algorithms with kappa values of .82 (Leekam et al., 2002, p.334).

The reliability of using the DISCO algorithm for Asperger's Syndrome based on Wing's (1981) and Gillberg and Gillberg's (1989) criteria is not known. Research by Leekam, Libby, Wing, Gould, and Gillberg (2000) was undertaken,

though, that compared Gillberg's criteria (Ehlers & Gillberg, 1993; Gillberg & Gillberg, 1989) and ICD-10 criteria for Asperger's Syndrome. It was found that the two criteria did not compare well in their ability to diagnose Asperger's Syndrome due to the ICD-10 requirement for normal development in language, cognition, and adaptive skills. However, the discrepancy between the two sets of criteria was found to be due not so much to the ICD-10 requirement for normal development in language and cognition as to the ICD-10 requirement for normal development in adaptive skills.

The internal consistency of the Total Rated Disco Items scores in the present research was calculated. The Cronbach alpha coefficient was .84. Since a value above .7 can be considered reliable (Pallant, 2000), the use of the Total Rated Disco Items with the present sample can be considered reliable.

The Childhood Autism Rating Scale (CARS)

The Childhood Autism Rating Scale (Schopler et al., 1988) evaluates 15 dimensions of behaviour:

1. Relating to people

2. Imitation

3. Emotional response

4. Body use

5. Object use

6. Adaptation to change

7. Visual response

8. Listening response

9. Taste, smell and touch response and use

10. Fear or nervousness

11. Verbal communication

12. Non-verbal communication

13. Activity level

14. Level and consistency of intellectual response

15. General impression in relation to presence of autism.

The CARS can be used as part of a diagnostic evaluation and was developed with the conception of autism as occurring along a continuum of disabilities (Wing & Gould, 1978). The Mild to Moderately Autistic range is indicated by a CARS score of between 30 to 36 total points score. The Severely Autistic range is indicated by a CARS score of higher than 36.

Schopler et al. (1988) report that the CARS has been found to have excellent reliability. A high degree of internal consistency was found with a Cronbach alpha co-efficient of .94 (p. 4). This indicates that the scale scores measure related facets of behaviour that are indicative of autism. Schopler et al. (1988) also report that good criterion-related validity has been indicated between CARS scores and expert clinical ratings with a correlation of $r = .84$ ($p < .001$) (p. 5).

Behaviour Rating Inventory of Executive Function (BRIEF)

The Behaviour Rating Inventory of Executive Function (BRIEF; Gioia et al., 2000) is a standardised measure of executive functioning that is suitable for use with students between 5 and 18 years of age. There is a Teacher Form and a Parent Form of the BRIEF but in the present research only the Teacher Form was used.

The BRIEF was designed to measure executive functioning in terms of eight clinical scales:

1. Inhibit (the ability to resist distraction)

2. Shift (the ability to switch from one task to another)

3. Emotional Control (the ability to modulate emotional responses)

4. Initiate (the ability to start a task without prompting)

5. Working Memory (the ability to hold information in short term memory in order to work with the information)

6. Plan/Organise (the ability to plan and sequence to achieve a goal)

7. Organisation of Materials (the ability to ensure one has the materials necessary to undertake a task)

8. Monitor (the ability to self-monitor performance).

These clinical scales also form two broader indexes which are called the Behavioural Regulation Index (which is comprised of the clinical scales Inhibit, Shift, and Emotional Control) and the Meta-cognition Index (which is comprised of the clinical scales Initiate, Working Memory, Plan/Organise, Organisation of Materials, and Monitor). A composite summary score called the Global Executive Composite incorporates all the clinical scales.

In the BRIEF, raw scores are converted to T scores. This enables normative comparisons of a student's scores with a standardised sample. A T score at or above 65 is considered to have clinical significance.

The BRIEF *Professional Manual* (Gioia et al., 2000) reports that the BRIEF has good reliability. The internal consistency and stability of each of the clinical scale scores and index scores has been measured. For a clinical population internal consistency using the Teacher Form yielded Cronbach alphas on the clinical scale scores that ranged from .84 to .95 and index scores that ranged from .96 to .98 (p. 51). Test-retest correlations for the Teacher Form ranged from .83 to .92 for clinical scale scores and from .90 to .92 for index scores (p. 51).

With regard to the validity of the items in the BRIEF, the BRIEF *Professional Manual* (Gioia et al., 2000) reports that agreement was sought among twelve paediatric neurologists during the construction and refinement of the items in the BRIEF. As the items were refined, high item-total correlations, high inter-rater agreement among the paediatric neurologists, and high inter-rater agreement among the authors was required as a check on the validity of the items.

The internal consistency reliability of the BRIEF clinical scales in the present research was calculated. The Cronbach alpha coefficient was .79. Since a value above .7 can be considered reliable (Pallant, 2000), the use of the clinical scales with the present sample can be considered reliable.

Achenbach System of Empirically Based Assessment (ASEBA)

The Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2001) was formerly called the Child Behaviour Checklist (Achenbach & Edelbrock, 1983) and is a standardised behavioural measure. A number of behaviours are rated in a questionnaire format. A three point scale is

used to rate items (0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or very often true*). The version for children from 6 to 18 years of age provides separate norms (*T* scores and percentiles) for children aged 6 to 11 and 12 to 18. There are also different norms for both sexes.

In the present sample one student participant in Group One and one in Group Two were 5 years and 11 months at the beginning of the first intervention period and one student participant in Group One was 5 years and 3 months at the beginning of the first intervention period. However, it is stated in the ASEBA manual that the version for children from 6 to 18 years may be used for 5 year olds who are at school (Achenbach & Rescorla, 2001, p. 5).

Parallel versions of the ASEBA have been developed for parents and teachers. The parent form is called the Child Behaviour Checklist (CBCL) and the teacher form is called the Teacher Report Form (TRF). Both forms were used in the present research.

For both the parent and teacher forms separate scales have been developed on the basis of factor analysis for eight empirically-based syndromes:

1. Anxious/Depressed
2. Withdrawn/Depressed
3. Somatic Complaints
4. Social Problems
5. Thought Problems
6. Attention Problems
7. Rule-Breaking Behaviour
8. Aggressive Behaviour.

In addition, some behaviours which are not in any of these eight factor-based syndromes are grouped as Other Problems. For both the parent and teacher forms, specific syndromes are grouped into two broad groupings of syndromes called Internalising (which consists of the Anxious/Depressed, Withdrawn/Depressed, and Somatic Complaints syndromes) and Externalising (which consists of the Rule-Breaking Behaviour and Aggressive Behaviour syndromes). The Total Problems score is the sum of all the syndrome scale scores and the score for Other Problems.

In the ASEBA, raw scores are assigned normalised *T* scores. This enables comparisons of a subject's scores with a normative sample. For the syndrome scales, *T* scores equal to or greater than 70 (above the 97th percentile) are considered to be in the *Clinical* range. Scores in this range indicate that enough problem behaviours were reported for the score to be of clinical concern. *T* scores of 65 to 69 (93rd to the 97th percentile) are considered to be in the *Borderline* range. Scores in this range are high enough to be of concern but are not considered to be of clinical concern. *T* scores equal to or less than 64 (below the 93rd percentile) are considered to be in the *Normal* range.

The cut-points for the Clinical, Borderline, and Normal ranges for the Internalising, Externalising, and Total Problems scores are lower (i.e., less conservative) than for the syndrome scale scores. For these composite scores *T* scores equal to or greater than 64 are considered to be in the Clinical range (above the 90th percentile), *T* scores of 60 to 63 (84th to the 90th percentile) are considered to be in the Borderline range, and *T* scores equal to or less than 59 (below the 84th percentile) are considered to be in the Normal range.

The ASEBA *Manual* (Achenbach & Rescorla, 2001) reports that the ASEBA has good reliability. For each of the syndrome scales, internal consistency was supported by Cronbach alphas that ranged from .78 to .97 on the parent form and .72 to .95 on the teacher form (p. 102). Test-retest reliability for the parent form ranged from .82 and .90 for the syndrome scales, and .91 and .94 for the groupings of syndromes (p. 101). Test-retest reliability for the teacher form ranged from .60 for the Withdrawn/Depressed scale to from .72 to .95 for all other syndrome scales (p. 101). Test-retest reliability for the teacher form for the groupings of syndromes ranged from .86 to .95 (p. 101).

The ASEBA *Manual* (Achenbach & Rescorla, 2001, p. 135) reports that the validity of the ASEBA has been well established by research over nearly twenty years. The items have been refined over that time but there is strong support for the current items and scales and for their ability to distinguish between clinically referred and normally functioning children.

The internal consistency of the syndrome scales in the ASEBA-CBCL and ASEBA-TRF in the present research was calculated. The Cronbach alpha

coefficient for the ASEBA-CBCL was .89 and for the ASEBA-TRF was .75. Since a value above .7 can be considered reliable (Pallant, 2000), the use of the ASEBA-TRF and ASEBA-CBCL syndrome scales with the present sample can be considered reliable.

The Wechsler Scales of Intelligence

The Wechsler scales are standardised measures of intellectual ability. A set series of questions and activities are given and scored. There are two different tests that can be used according to age. The Wechsler Preschool and Primary Scale of Intelligence – Third Edition (WPPSI-III; Wechsler, 2002) is used for younger children (2.6 to 7.3 years) and the Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV; Wechsler, 2003a) is used for older children (6 to 16.11 years). The Australian Standardisations of the WPPSI-III (Wechsler, 2004) and the WISC-IV (Wechsler, 2003b) were used in the present research.

In the Wechsler scales raw scores can be converted to standardised scale scores based on the child's age given in years and months. Sums of scaled scores can then be converted to standardised composite scores or percentile ranks. The composite scores in the WPPSI-III are the Verbal Intelligence Quotient, the Performance Intelligence Quotient, the Processing Speed Quotient, and the Full Scale Intelligence Quotient. The composite scores in the WISC-IV are the Verbal Comprehension Index, the Perceptual Reasoning Index, the Working Memory Index, the Processing Speed Index, and the Full Scale Intelligence Quotient. A child's composite scores can also be given in terms of the following qualitative descriptions: 130 and above, Very Superior; 120-129, Superior; 110-119, High Average; 90-109, Average; 80-89, Low Average; 70-79, Borderline; 69 and below, Extremely Low.

The Wechsler scales have excellent reliability. The WPPSI-III *Technical and Interpretive Manual* (Wechsler, 2002) reports that for the age band of children in the present research, the average reliability coefficients for the WPPSI-III composite scores range from .89 to .96 (p. 53). The WISC-IV *Technical and Interpretive Manual* (Wechsler, 2003a) reports that across all test ages the average reliability coefficients for the composite scores range from .88 to .97 (p. 34).

The *Technical and Interpretive Manual*s for the WPPSI-III (Wechsler, 2002) and for the WISC-IV (Wechsler, 2003a) present a number of kinds of evidence for the validity of the Wechsler scales.

The Neale Analysis of Reading Ability

The Neale Analysis of Reading Ability (3rd ed.) (Neale, Australian Standardisation, 1999) is a standardised reading test that can be used by classroom teachers as well as professionals specialising in reading. In the present interventions the stories associated with the Form 1 version were used.

The stories are constructed to present six levels of increasingly difficult vocabulary and grammar. The test material is presented as a book. Each story is accompanied by simple line drawings that set the scene rather than illustrate details within the story. The student reads passages aloud to the examiner. Accuracy is assessed by recording the student's errors. The student's comprehension of each story is also assessed after each oral reading, provided that reading errors are not above a certain limit. A reading rate measurement can also be obtained, but this measurement was not done in the present research.

In the Neale a student's raw score can be converted to a score in terms of age, a percentile rank, or a stanine, that is normed according to the student's year of schooling. A student's percentile rank can also be given in terms of the following performance descriptors: Very Low (below 11th percentile), Below Average (11th to 23rd percentile), Average (23rd to 77th percentile), Above Average (77th – 89th percentile), and Very High (above 89th percentile).

The Neale *Manual* (Neale, 1999) reports that the Neale has good reliability. The internal consistency reliability across all of the primary schooling years has been found to be .95 to .96 for Reading Accuracy (Form 1) and between .71 and .96 for Reading Comprehension (Form 1) (p. 72).

The Neale *Manual* (Neale, 1999) also reports that the Neale has excellent validity. Good correlations with other reading measures have been found and a substantial number of studies have now used the Neale as a reading measure for research purposes (pp. 73-82).

Wechsler Individual Achievement Test – Second Edition (WIAT-II)

In the present research several subtests of the Wechsler Individual Achievement Test (WIAT-II; Wechsler, 2001) were administered and scored using the Australian Standardisation (Wechsler, 2007). The subtests administered were:

1. Word Reading

2. Maths Reasoning

3. Written Expression.

The Word Reading subtest of the WIAT-II was used in addition to the Neale (1999) because the WIAT-II assesses single word reading ability and so differs from the Neale which assesses reading words in sentences. In addition, all of the WIAT-II subtests can be compared with results predicted from intelligence scores in the Wechsler intellectual scales.

The WIAT-II *Technical Manual* (Wechsler, 2001) reports that a range of reliability measures indicate that the WIAT-II has excellent consistency and stability across time. A combination of split-half reliability and test-retest reliability in the 5 to 12 year old range has indicated co-efficient values from .97 to .99 for Word Reading, .92 to .94 for Math Reasoning and .81 to .87 for Written Expression (p. 106).

The WIAT-II *Technical Manual* (Wechsler, 2001) also reports that accumulated data from studies of the WIAT-II indicates that the subtests have content, construct, and criterion-related validity (p. 140).

Special Learning Difficulties

Testing using the WIAT-II allows for ascertaining if there is a significant difference between a student's academic abilities and intellectual ability. This is helpful in determining if a student is performing in a particular area of academic functioning to the same level as predicted by their intellectual ability or more ably or less ably than predicted.

There is not yet consensus in defining the concept of *Specific Learning Disability* but for the purpose of analysis in the present research Specific Learning Disability is understood in terms of the ability-achievement discrepancy

definition. In this definition a student's assessed achievement in a particular academic task is compared with a predicted score of achievement that is based on their intellectual functioning. If actual achievement is lower than predicted achievement, to at least a .05 level of significance, then the student is said to have a Specific Learning Disability in relation to that particular area of academic functioning (Keogh, 1990). The term *specific* is important because it clarifies that the student exhibits deficits in a particular ability area rather than having generally low functioning (Van Kraayenoord & Elkins, 1998). These deficits are unexpected in the sense that the student's ability in this particular academic area is very different to what might be expected from their intellectual ability. According to this definition of Specific Learning Disability, it is possible to determine whether or not a student of any level of intellectual ability is performing significantly differently to what is predicted for that level of intellectual ability. This is worked out on the basis of the achievement-discrepancy tables provided in the WIAT-II *Technical Manual* (Wechsler, 2001). From the tables it can be worked out whether the student's academic functioning was significantly lower than predicted (i.e., had a Specific Learning Disability), significantly higher than predicted, or to the level that was predicted.

Theory of Mind Tests

In the present interventions a selection of theory of mind tests were administered which will be referred to as (a) the Sally and Anne test, (b) the test involving the "Banana" story, (c) the test involving the "Picnic" story, and (d) the test involving the "Fido" story. The "Banana" story and the "Picnic" story (Appendix E) are two of the "Strange Stories" developed by Happé (1994a). The "Fido" story (Appendix E) is from Kaland et al.'s (2002) "Stories from Everyday Life".

The version of the Sally and Anne test used in the present interventions involves a set oral script based on Wimmer and Perner's (1983) test. The set oral script is read while being enacted using two dolls, a box, a basket, and a marble (see Appendix E). The script concludes, "Where will Sally look for her marble?"

In the tests involving the "Banana" story and the "Picnic" story, each story is read orally and repeated if the student requests it. At the end of each story a comprehension question is asked and then a question is asked which requires a mental inference.

In the test involving the "Fido" story, the story is read orally and a set series of comprehension questions are asked. Most of the questions are very concrete and move sequentially through the details in the story. In this way it is checked whether or not the student has understood the fundamental details in the story. If the student does not answer the concrete questions correctly, the correct answer is given in order to support the student's comprehension. There are also two key questions within the series of comprehension questions. One occurs about half way through the series of questions and relates to a detail about a physical description in the story. The other question comes at the end of the series of questions and is a question requiring understanding of a mental state. The structure of the test makes it possible to know whether or not the student has had difficulty understanding a mental state inference even if they have comprehended the concrete details in the story.

Sensory Profile

The Sensory Profile (Dunn, 1999) evaluates sensory responses. A questionnaire is administered to the child's primary caregiver. In responding to this questionnaire, the caregiver reports on a five point scale how frequently the child responds in a particular way to a given sensory event. The questionnaire results are then converted to a percentile rank and it is reported if there is a *definite difference* (at or below the 2nd percentile) or a *probable difference* (from 3rd to 16th percentile) between the child's sensory responses and the sensory responses of a normal population or if the child's sensory responses are a *typical performance* or *within expected thresholds* (at or above the 17th percentile).

In the Section Summary the items in the questionnaire are summarised into fourteen sections that are grouped in the following way:

1. Sensory Processing (responses to the basic sensory systems)

    Section A. Auditory Processing (responses to things heard)

    Section B. Visual Processing (responses to things seen)

    Section C. Vestibular Processing (responses to movement)

    Section D. Touch Processing (responses to stimuli that touch the skin)

    Section E. Multisensory Processing (responses to activities that contain a combined sensory experience)

    Section F. Oral Sensory Processing (responses to touch and taste stimuli in the mouth)

2. Modulation (ability to monitor and regulate neural messages in order to generate an appropriate response to the stimuli)

    Section G. Sensory Processing Related to Endurance/Tone (ability to sustain performance)

    Section H. Modulation Related to Body Position and Movement (ability to move effectively)

    Section I. Modulation of Movement Affecting Activity level (demonstrated activeness)

    Section J. Modulation of Sensory Input Affecting Emotional responses (ability to use body senses to generate emotional responses)

    Section K. Modulation of Visual Input Affecting Emotional Responses and Activity (ability to use visual cues to establish contact with others)

3. Behavioural and Emotional Responses

    Section L. Emotional/Social Responses (ability to use social coping strategies)

    Section M. Behavioural Outcomes of Sensory Processing (ability to meet performance demands)

    Section N. Items Indicating Thresholds for Response.

The items in the questionnaire are also grouped to form nine factors which characterise children by their responsiveness to sensory input, whether overly responsive or under-responsive. These factors are:

1. Sensory Seeking

2. Emotionally Reactive

3. Low Endurance/Tone

4. Oral Sensory Sensitivity

5. Inattention/ Distractibility

6. Poor Registration

7. Sensory Sensitivity

8. Sedentary

9. Fine Motor/Perceptual.

The Sensory Profile *User's Manual* (Dunn, 1999) reports the internal consistency Cronbach alpha for each section and for each factor. The sections had coefficient alphas ranging from .58 to .90 except for Section N, which had a coefficient of .47. The factors had coefficient alphas ranging from .72 to .89 (p. 48). Section N has only three contributing items and this may explain its low reliability. Results in this section are not reported in the present research.

The Sensory Profile *User's Manual* (Dunn, 1999) reports that content validity of the Sensory Profile was established during the development of the Sensory Profile through expert review and through research comparing findings in the Sensory Profile with other measures (p. 52).

Survey Questions for Teacher and Parent Participants

Two sets of survey questions were formulated by the writer for teacher participants (Appendices F and G) and two sets of survey questions were formulated by the writer for parent participants (Appendices H and I). In each case one set of questions was formulated for use before the intervention and the other set of questions was formulated for use after the intervention. The questions for teachers and parents were parallel, where appropriate, and the questions asked before and after the intervention were parallel, where applicable.

The survey questions related to knowledge about ASDs, knowledge about interventions that could be used, the relationship between teachers and parents, and appropriate school placement options. Most items consisted of two parts. The first part was a question which asked for a *Yes* or *No* answer or for an answer chosen from a given range of answers. The second part was a further question which asked for a descriptive answer. Content validity was refined with the help of the writer's supervisors who have many years of expertise in the field of autism.

In summarising answers to the questions which asked for descriptive answers, these answers were first grouped according to similarity of content. The grouping of answers was checked by a blind procedure in which a professional familiar with special education also read the entire set of answers and grouped them according to similarity of content. Inter-rater reliability of the groupings was calculated using the formula suggested by Wolery, Bailey, and Sugai (1988, p.92). This formula is:

$$\frac{Number\ of\ Agreements}{Number\ of\ Agreements + Disagreements} \times 100 = \%\ Agreement$$

Wolery et al. (1988) suggest that agreement above 90% should be required. For each question which asked for descriptive answers, the grouping of answers satisfied this suggested requirement of having at least 90% agreement.

Evaluation Questions in Relation to the Whole School Session

In the present intervention a whole school session was conducted. In order to obtain some feedback in relation to this session, a brief survey was formulated by the writer (Appendix J). The question related to the relevance of the session, how the session had changed teachers' practice, and if there were any elements missing from the session. These survey questions were not given to all staff but to the teachers participating in the project and a special needs teacher or person in the school responsible for special needs (if allocated).

Procedure

Consent Procedures

Consent to implement and evaluate the research model was obtained from the Social and Behavioural Research Ethics Committee, Flinders University, South Australia (Appendix K) and the Executive Officer of School Research, Department of Education, Employment and Training, Victoria [now Department of Education and Early Childhood Development] (Appendix L).

Communication with Regional Staff and Network Support Staff

The autism consultant communicated with regional staff and network support staff.

Communication with School Principals

The autism consultant communicated with the principals of government primary and P-12 schools within 50 kilometres of her home. These schools were in either the Warrnambool District or the Corangamite District of the Barwon South Western Region of the Victorian Department of Education and Training. There were fifteen of these schools. In these communications the autism consultant referred to the implementation and evaluation of the research model as *the project* and this term will be used in the following sections.

It was outlined to the school principals in initial discussions that the implementation of the research model would have an emphasis on support of an individual student who had an ASD and support of that student's classroom teacher and teacher aide (if allocated). It was also outlined that the whole school would need to be committed to the implementation of the research model and would need to work toward inclusive practices. As well, it was outlined that the implementation of the research model would require collaborative problem solving between all parties, including the participating teacher and the autism consultant.

In initial discussions agreement was also sought from the school principal and teachers in relation to collaboration and communication with parents. The requirement of parental involvement in all of the ongoing meetings was made

clear. It was also made clear that if there was specific necessity more frequent communication methods between teachers and parents might need to be put in place (e.g., a communication book with parents).

Time Commitment of Participants

It was outlined to the school principals in a Letter of Introduction (Appendix M) that the research project would be a four month (sixteen school weeks) project which would occur during the first half of the year for some students and during the second half of the year for other students. Participation in the project would involve commitments to the following:

1. The whole school would be involved in a training session of approximately an hour which would provide an opportunity to learn about ASDs. Staff time would need to be allocated to this training.

2. The participating student's classroom teacher and teacher aide (if a teacher aide had been allocated to the student) would be involved in nine fortnightly collaborative planning and support sessions of one hour each. Time release would need to be made available to the classroom teacher and teacher aide (if allocated). The participating student's parents would be invited to be involved in these sessions. These sessions would provide general information about the range of needs of a student with an ASD but the ongoing focus of the sessions would be collaboratively deciding upon educational interventions to support the participating student across a range of curriculum domains. The success of these interventions would be monitored and modified if necessary.

3. The classroom teacher would complete questionnaires before and after her or his participation in the project. This would take approximately one hour each time.

It was emphasised to the school principals that participation in the project by the school, teachers, and parents was to be voluntary. It was also explained that the school principal, participating teachers, and participating parents would be able to contact the university supervisors of the research project if they wanted more information.

Establishment of a Clear Understanding of Processes

The establishment of agreed processes was also sought from the school principal in relation to the possibility that the planning and support group might make decisions about interventions that, if implemented, would go beyond the classroom. If decisions about such interventions were made, then a process for implementing these interventions needed to be clearly established with the school principal.

School and Teacher Involvement in the Project

It was the responsibility of the school principal to consult with leading teachers, special needs teachers, classroom teachers, and teacher aides in relation to the possibility of involvement in the project. The school principals gave a copy of the Letter of Introduction to teachers who had a student with an ASD in their classes and who were interested in participating in the project. As explained in the preceding, this letter included an explanation of what involvement would mean for participating teachers. Written consent was obtained by means of completed consent forms (Appendix N) from all participating teachers of all participating students prior to the commencement of the project.

Parent Involvement in the Project

If a teacher who had a student with an ASD in her or his class informed the school principal that she or he was interested in participating in the project, it was then the responsibility of the school principal to discuss with the parents or guardians of the student whether they were interested in participating in the project. The school principals gave a Letter of Introduction (Appendix O) to parents or guardians who were interested. This letter explained that participation in the project would require the following:

1. Involvement in nine fortnightly collaborative planning and support sessions of one hour each involving the participating student's classroom teacher and teacher aide (if allocated). These sessions would occur during the first half of the year for some students and during the second half of the year for other students.

2. Discussion with the autism consultant about their child's developmental and current behaviours. This would take approximately two hours before and thirty minutes after their participation in the planning and support sessions.

3. Completion of questionnaires. This would take one hour and twenty minutes before and fifty minutes after their participation in the planning and support sessions.

4. Intellectual assessment of their child (if this had not been completed less than a year ago). This would take 1½ to 2 hours.

5. Further academic assessment of their child. This would take 35 to 55 minutes.

Written consent was obtained by means of consent forms (Appendix P) from the parents or guardians of all participating students prior to the commencement of the project.

School Responses

Of the fifteen schools that were approached to take part in the project, nine responded affirmatively. Three principals replied that there were no students with an ASD in their school, one principal replied that the teacher of a student with an ASD at that school was unwilling to be involved, one principal replied that the parent of a student with an ASD at that school was unwilling to be involved, and one school was in a time of transition and unable to make such a decision.

Intervention and Wait-Control Periods

Eighteen students in the nine schools who responded affirmatively participated in the project. As described in the "Participants" section of this chapter, the students in this sample were allocated to two matched groups.

Group One was involved in the intervention during Period 1, which was 18 weeks, however, this period included 2 weeks of school holidays. Therefore, Group One was involved in the intervention at school for 16 school weeks. Due to organisational difficulties Group Two student participants (when they were a wait control group) were not assessed until 2 weeks after the beginning of Period 1. This meant that they were a wait-control group for 16 weeks of Period 1.

Group Two was then involved in the intervention during Period 2. This period of time also included 2 weeks of school holidays. Due to the difficulties in carrying out assessments at the very end of the school year, Period 2 ended one week early and was only 17 weeks long. Because this period included 2 weeks of school holidays, Group Two was involved in the intervention at school for 15 school weeks. The dates when Periods 1 and 2 started and finished are given in Table 5.6.

Table 5.6
Assessment and Intervention Periods for Group One and Group Two Participants

2006	Group One			Group Two		
	Assessments		Intervention	Assessments		Intervention
	DISCO or Rated Disco Items	BRIEF, ASEBA, Surveys		DISCO or Rated Disco Items	BRIEF, ASEBA, Surveys	
January						
February						
March	Started 27th					
April	Finished 7th	Started 10th Finished 24th	Started 10th	Started 24th		
May				Finished 5th		
June			Holidays			
July	Started 31st	Started 31st				
August	Finished 11th	Finished 11th	Finish 11th	Started 14th Finished 25th	Started 14th Finished 25th	Started 14th
September						Holidays
October						
November						
December				Started 11th Finished 21st	Started 11th Finished 21st	Finish 15th

Comprehensive Assessment

Comprehensive assessment of each student was undertaken across multiple domains of the student's functioning. Behaviours specific to autism were assessed by administering the DISCO through interviews with the students' parents. The results of these interviews with parents were used to provide diagnostic verification and diagnostic categorisation of the students. Severity of autism was assessed by administering the CARS rating scale through interviews with the students' parents unless the CARS had been administered by another psychologist in relation to a student within the year prior to the commencement of the research project.

Executive functioning ability in the classroom context was assessed using the BRIEF by asking teachers to complete the Teacher Form. Problem behaviours were assessed using the ASEBA by asking teachers to complete the ASEBA-TRF and by asking parents or guardians to complete the ASEBA-CBCL.

Intellectual ability was assessed by administering a Wechsler intelligence test except for five students to whom a Wechsler intelligence test had been administered in the year prior to the present research. Reading accuracy and reading comprehension were assessed by administering the Neale using the stories associated with the Form 1 version. Academic abilities were assessed by administering WIAT-II sub-tests. Theory of mind skills were assessed by administering a selection of theory of mind tests. The Sally-Anne test and the tests which involved the "Banana" story and the "Picnic" story were administered to all students. The test which involved the "Fido" story was only administered to students who were in at least Grade 4 (fifth year of schooling) and within the age range of the participants in Kaland et al.'s (2002) study. These students were three students in Group One and three students in Group Two.

Sensory differences were assessed by administering the Sensory Profile questionnaire to the students' parents.

All assessments administered directly with students or through interview were administered by the autism consultant unless otherwise noted. Some of the assessments required teachers' written responses to a questionnaire. All teachers completed the questionnaires in their own time and returned them by a designated

time. Some of the assessments required parents' written responses to a questionnaire. Parents were asked if they wanted to complete the questionnaire on their own or with support. They were asked this to make sure that they were not embarrassed by the literacy demands of the task. Fifteen of the eighteen parents in the project responded that they wanted to complete questionnaires with support. Sometimes literacy support was needed, in which case the questions were read to the parents and their answers were scribed. In general, though, parents were able to read the questions and respond in written form to the questions on their own, but they preferred to do so during a designated time when support was available. In this way the parents were able to ask for clarification if they did not fully understand a question.

All of these assessments were undertaken primarily to gain specific information about the student's functioning, to understand the needs of each student better, and to facilitate informed decision making and goal setting regarding interventions to be worked on in the course of the implementation of the research model. Student outcomes were also closely monitored through a variety of quantitative and qualitative assessment measures.

Parents were fully informed in relation to assessment results and a report containing all the initial assessment results was given to parents. All parents agreed that a copy of the report containing all the initial assessment results would be kept in the school file.

All of the assessment instruments except the Survey Questions for teachers and parents participating in the research project were also used to gain detailed information concerning the characteristics of the sample across various areas of functioning before the interventions. Some of the assessment instruments were also used to assess if there was behavioural change over time and these assessment instruments were used two or three times. With these assessments the first assessment gave base information that could be used to ascertain if change in functioning occurred in subsequent measures.

The Rated Disco Items were administered two times with regard to Group One students and three times with regard to Group Two students. The first administration of the Rated Disco Items was included in the administration of the

full DISCO with regard to both Group One and Group Two students at the beginning of Period 1, that is, before the Group One intervention period and before the Group Two wait-control period. The Rated Disco Items were administered a second time with regard to both Group One students and Group Two students at the end of Period 1, that is, after the Group One intervention period and the Group Two wait-control period and before the Group Two intervention period. The Rated Disco Items were administered a third time with regard to Group Two students at the end of Period 2, that is, after their intervention period.

The BRIEF Teacher Form, the ASEBA-TRF, and the ASEBA-CBCL were administered two times with regard to both Group One and Group Two students. Teachers completed the BRIEF Teacher Form and the ASEBA-TRF at the start and end of the intervention periods for students in both Group One and Group Two and parents completed the ASEBA-CBCL at the start and the end of the intervention periods for both Group One and Group Two students.

The dates when the assessment periods started and finished are given in Table 5.6. More detail about the particular assessments conducted at in each assessment period for Group One and Group Two students, parents, and teachers is given in Table 5.7.

The Collaborative Planning and Support Group

Participants and meetings

The autism consultant facilitated the formation of a collaborative planning and support group for each student who was a participant in the intervention. This group consisted of the student's teacher, the student's teacher aide (if the student was allocated an aide), one of the student's parents or guardians, the autism consultant, and other support professionals as necessary.

As already stated, some participating students already had a Student Support Group in place at the school. During the research project the regular collaborative planning and support group meetings were held in addition to Student Support Group meetings. However, in each case in which Student Support Group meetings were in place, the research model worked as an adjunct

Table 5.7

Assessments Administered or Completed During Each Assessment Period

Assessment period	Assessment type	Group One	Group Two
	Assessment information from parent observations	DISCO CARS ASEBA Sensory Profile Survey Questions	DISCO CARS
Start of Period 1	*Assessment administered directly with students*	Wechsler Scale (if necessary) Neale-3rd Ed. WIAT-II subtests Theory of mind tests	
	Assessment information from teacher observations	BRIEF ASEBA Survey Questions	
	Assessment information from parent observations	Rated Disco Items ASEBA Survey Questions	Rated Disco Items ASEBA Sensory Profile Survey Questions
End of Period 1/ Start of Period 2	*Assessment administered directly with students*		Wechsler Scale (if necessary) Neale-3rd Ed. WIAT-II subtests Theory of mind tests
	Assessment information from teacher observations	BRIEF ASEBA Survey Questions	BRIEF ASEBA Survey Questions
	Assessment information from parent observations		Rated Disco Items ASEBA Survey Questions
End of Period 2	*Assessment information from teacher observations*		BRIEF ASEBA Survey Questions

to the Student Support Group. For students who had this in place the autism consultant attended a Student Support Group meeting prior to the beginning of the intervention period for that student.

The collaborative planning and support group for each student in the research project met every fortnight during the intervention period. Throughout the regular meetings of each planning and support group, the autism consultant facilitated collaborative decision making. From the beginning of these meetings the autism consultant made it clear to the members of the group that each member would be an important contributor to the decisions that would be made about supportive interventions for the student.

Content of training in the group meetings

The first meeting of each collaborative planning and support group was allocated to a general training session. The aim of the session was to increase the group members' general knowledge of ASDs and their understanding of the range of functioning domains requiring intervention. As well, a resource kit for teachers was given to each member of the group and was looked at together in the training session but was also referred to in an ongoing way throughout the meetings of the group when relevant. This kit was produced by the Autism Association of Western Australia and is called *Autism in the Classroom. A Resource Kit for Teachers of Students with and Autism Spectrum Disorder* (McKenna, Reed, Alach, & Marshall, 2005). This resource covers three areas:

1. What is Autism Spectrum Disorder?

2. Making it work: Making curriculum accessible for students with an Autism Spectrum Disorder.

3. Preventing and Managing Difficult Behaviour.

Common language difficulties that children with an ASD can experience were discussed. These included their tendency to understand language literally, their difficulty with the pragmatic aspects of language (such as asking for help), their tendency not to be drawn to the human voice, and their difficulty in understanding such things as that language directed toward a group being also directed toward them as individuals.

Additional material was produced by the autism consultant for teachers in relation to general language use when engaging with a student with an Autism Spectrum Disorder (Appendix Q). This material was based on discussion about language use in Janzen (2003). This material was discussed throughout the group meetings at appropriate times. Understanding about these language difficulties was also helpful for parents to understand in the home context.

In addition to general explanations about the language difficulties experienced by students with an ASD, the autism consultant helped the teacher, teacher aide, and parent to be more aware of the student's receptive, expressive, and pragmatic language difficulties. Information about the student's language abilities had been gathered from previous language assessments, and intellectual assessment indicated the student's verbal processing ability and auditory memory ability. The student's difficulties with receptive and/or expressive language were explicitly explained to the teacher and parent. If the student had a receptive language difficulty, it was emphasized that the teacher and parent could not assume that the student had understood a verbal instruction. If the student had a marked expressive language difficulty, then it was explained to the teacher and parent that the student would have particular difficulty in explaining an incident which had just happened in the playground or at home and would have similar difficulty in expressing a need or asking a question.

Deciding about and implementing interventions

At the second meeting of the collaborative planning and support group for each student, the autism consultant asked the teacher and the parent to identify what their main concerns were. The autism consultant then helped in the setting of obtainable goals. Each goal was decided by the group but each goal was a goal that the teacher wanted to implement. No goal was decided upon that the teacher was not committed to. The aim was to work on specific things of high relevance to the teacher and the parent and to work on these things one at a time. In this way it was hoped that the teacher and the parent would see that something was being worked on in a specific area as soon as possible and that the teacher would see that setting goals could be meaningful rather than just a paperwork task. It was

also hoped to broaden the teacher's understanding of the range of goals that could be set (i.e., social and emotional goals, as well as academic goals) and to help the teacher learn how to make goals very specific.

Having set a goal, the group worked out how the goal would be implemented. This involved deciding upon the exact shape of the intervention which would be undertaken for the student. The group decided upon support for the student through structural intervention before deciding about curricular intervention. The autism consultant helped with decisions about interventions by providing formal assessment results which were discussed with the group. It has been noted that assessment was primarily aimed at understanding the functional needs of the student so that intervention support could be well targeted. Accordingly, intellectual assessment results gave information about the student's specific strengths and weaknesses in intellectual functioning. Assessment of theory of mind functioning gave information about the student's difficulties in social interactions. Assessment of executive functioning gave information about the student's difficulties in executive functioning that might affect the classroom. Academic assessment results gave specific information about the student's needs for curriculum adaptation and extra support needs. The autism consultant also helped with decisions about interventions by providing specific knowledge about possible interventions. These solution possibilities were based on structured teaching practices.

Having worked out what intervention would be implemented, the group worked out how to implement the intervention. The autism consultant helped in the implementation of interventions by providing resources and by making teachers aware of the resources available. These could be structural resources or curriculum resources.

Evaluating interventions

At subsequent meetings of the collaborative planning and support group, there was always evaluation of interventions which had already begun to be implemented. Progress was reported on and further discussion occurred about the success of the intervention or the need for further modification. If the intervention

was successful, the group would gain knowledge about the effectiveness of the intervention. If the intervention was not successful, the group would discuss other possible interventions.

As well as evaluating interventions which had already begun to be implemented and, as time permitted, more areas of concern were identified by the teacher and parent and decision making about the next goal occurred. As already explained, issues were worked on one by one and always by looking at all the layers of support that could be put in place. Plans were made together for the next meeting.

During the intervention period, the goals that were set, the interventions that were tried, and student progress were written up so that parents and the school could have a record. Parental approval was requested and given by all parents for a copy of these records to be kept in their child's school file.

Towards the end of the intervention period the autism consultant helped teachers learn about how specific goals could be written up in an individual education plan by using the goals that had already been implemented as examples. The autism consultant showed teachers how the implementation of these goals had been broken down into small specific steps that could be written up. The autism consultant and teacher together wrote specific follow-up goals.

Pre-intervention and post-intervention surveys were used to assess the knowledge gained and support received by teachers and parents.

Support from Other Professionals

When necessary, the autism consultant facilitated support for the students in the project from Education Department school support staff who had responsibility in the school the student attended. The autism consultant also facilitated support from other support professionals. School support staff were kept informed about all the students in the project. These support staff and other professionals were encouraged to attend meetings of the planning and support group.

If a student already had involvement with another professional, then the autism consultant facilitated communication between all parties to ensure that

everyone was well informed and working together. If the other professionals had made assessments or written reports in relation to the student, these assessments or reports were explained to the teacher and the parent. If, during the course of the meetings of the planning and support group for a particular student, it became clear that further assessment was necessary or that the student would benefit from access to another professional then this was sought.

If a school had an integration teacher some of these linking and practical tasks could be performed by them, but only three of the nine schools had a teacher in this role and even when this role had been allocated the teacher frequently had multiple roles within the school and so had limited time. In six of the nine schools in the project, the Principal or the Assistant Principal had assistance of students with disabilities tagged onto their other administrative responsibilities.

Whole School Training Session

The autism consultant facilitated a whole school training session for each participating school. The session itself was facilitated by the Department of Education and Training's regional autism consultant with the support of the project's autism consultant and involved the principal, teachers, and teacher aides at the school. This session was the only part of the intervention in which the participating parent was not involved. The project's autism consultant decided not to involve the participating parent in this session in order that teachers could express openly their feelings and concerns to the session facilitators and to one another.

The whole school training session went for an hour to an hour and a half and it occurred in a school within 2 to 5 weeks of when the intervention began. There was variation in the week in which the session occurred due to variation in the week in the term in which the staff meeting for that term was held.

Staff were educated about ASDs and provided with general information about this disability. However, the session focussed on the students at the schools who were participating in the project. The parent of each of these students was asked for permission to do this and the purpose in doing it was explained to them. The parent of each student gave permission for this to occur except in one case in

which the parent was still coming to terms with the diagnosis. In this case there were two students at the school who were participating in the project, so it was possible to focus on the other student in the whole school training session.

The aim of the whole school training session was that staff would discuss together the needs of the student with an ASD and the role they all played in supporting the student. It was hoped that staff would understand that support of a student with an ASD in a school involves all school staff to some extent. An important aspect of the session was for the facilitators to listen to staff needs and frustrations and to facilitate honest staff dialogue. It was hoped that the session would lead to greater staff empathy and increased problem solving ability.

Each whole school training session was conducted in an open forum style. The teachers and the facilitators went through a process entitled, "Building the Big Picture". The teachers' responses were written up on a whiteboard. Discussion was facilitated in regard to a number of areas:

1. Student's behaviours.

The teachers were encouraged to identify the student's behaviours that were of concern to them.

2. Teachers' emotional responses.

The teachers were then encouraged to identify their emotional responses to the student's concerning behaviours. They acknowledged that if these responses were negative, it was often very hard for them to be responding in these ways and, at the same time, to be managing the student's concerning behaviours.

3. Student's diagnosis and wider world

The teachers were then asked what they knew about the student's diagnosis and about ASDs. This was an opportunity for the facilitators to help the teachers to gain more understanding of the student's diagnosis and his or her learning needs, to clarify for the teachers the key difficulties for students with an ASD, and to teach a little more in areas where there was a lack of knowledge. The teachers were also asked what they knew about the student's life at home and in the wider community.

4. Student's assets.

The teachers were then asked what they had observed of the student's strengths and particular interests. The facilitators helped the teachers to gain more

understanding of the student's patterns of strengths and weaknesses that were evident in his or her intellectual profile, academic assessments, and other assessment results.

5. Student's emotional responses.

The teachers were then asked to think again about the student's concerning behaviours that had been identified previously. The facilitators helped the teachers to understand what these behaviours might suggest about the student's emotional states at the time of these behaviours. The teachers saw that the emotional states that the student's concerning behaviours had elicited in them were similar to the student's emotional states at the time of these behaviours. The teachers were able to see that the student's behaviours were often linked to stress, anxiety, or feelings of helplessness, and were a flight or fight response to the student's situations.

6. Management strategies and plans

The facilitators then encouraged the teachers to begin thinking about management strategies and plans. The facilitators also suggested strategies that were based around the problem areas identified by staff. There was an emphasis not only on classroom strategies but also on the importance of all teachers understanding what strategies were in place, for example, in the classroom, in the yard, and on excursions, so that all teachers could follow through with these plans and procedures if the need arose. It was emphasised that the classroom teachers needed to feel supported by all other teachers rather than feeling that they were alone in supporting the student.

Maintenance of Support for Participating Students

The final meeting of the collaborative planning and support group was also facilitated as a Student Support Group meeting. This occurred for each student in the research project regardless of whether a Student Support Group was already in place for the student or not. For each of the seven students in the project for whom a Student Support Group was not already in place, it was put in place at this meeting that a Student Support Group would continue for them. This was done so that support for all of the participating students would be maintained.

CHAPTER 6

THE PROFILE OF STUDENTS IN THE SAMPLE

Before the implementation of the research model, the functioning of each student in various areas was assessed. These assessments were carried out in order that the particular needs of each student could be well understood and interventions well targeted. However, it was a secondary aim of the research to obtain profiles for students in the whole sample and according to each autistic diagnostic category. This was done by analysing the assessment results.

Intellectual Ability

The intellectual ability of the students in the sample was assessed using the age-appropriate Wechsler intellectual assessment tool, either the WPPSI-III or the WISC-IV. Five students had been assessed in the year prior to the current research by other psychologists. Assessments of the other thirteen students were conducted by the writer for both Group One students and Group Two students before the implementation of the research model in relation to their respective groups. Verbal Comprehension Index scores (termed Verbal IQ scores in WPPSI-III), Perceptual Reasoning Index scores (termed Performance IQ scores in WPPSI-III), Processing Speed Index scores (termed Processing Speed Quotient scores in WPPSI-III), and Full Scale IQ scores were obtained for all eighteen students. Working Memory Index scores were obtained for only thirteen students because five younger children were administered the WPPSI-III and this assessment tool does not include any Working Memory subtests. Descriptive statistics of the Wechsler standard scores of the students in the whole sample and in each autistic diagnostic category are set out in Table 6.1. All of the scores of the students in the whole sample were found to be normally distributed on the basis that the Shapiro-Wilks statistic was more than .05 (Coakes & Steed, 1996).

The mean index scores and Full Scale IQ scores of the students in the whole sample were in the Low Average range except for their mean Perceptual Reasoning Index score which was in the Average range. The mean index scores and Full Scale IQ scores of the students with Autistic Disorder were in the Very

Table 6.1

Descriptive Statistics of Wechsler Intellectual Ability Standard Scores of Students in Each Autistic Diagnostic Category and in Whole Sample

Wechsler composite score	Students with AD		Students with AS		Students with ASD-NOS		Whole sample	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	n = 7		*n* = 7		*n* = 4		*n* = 18	
VCI	67.57[a]	13.21	99.86	10.97	73.50	4.44	81.44	18.48
PRI	80.86	20.38	102.00	8.15	86.00	14.33	90.22	17.43
PSI	73.57	13.15	92.57	8.12	73.75[a]	11.90	81.00	14.13
	n = 4		*n* = 6		*n* = 3		*n = 13*	
WMI	58.00	8.49	98.17	14.18	75.00[a]	1.73	80.46	20.85
	n = 7		*n* = 7		*n* = 4		*n* = 18	
Full Scale IQ	66.71	16.46	98.14	7.70	72.00	5.94	80.11	18.60

Note. AD = Autistic Disorder, AS= Asperger's Disorder, ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified, VCI = Verbal Comprehension Index, PRI = Perceptual Reasoning Index, PSI = Processing Speed Index, WMI = Working Memory Index
[a] Scores not normally distributed (Shapiro-Wilk's statistic $p < .05$)

Low or Low range except for their mean Perceptual Reasoning Index score which was at the low end of the Low Average range. The mean index scores and Full Scale IQ scores of the students with Asperger's Disorder were in the Average range. The mean index scores and Full Scale IQ scores of the students with ASD-NOS were in the Low range except for their mean Perceptual Reasoning Index score which was in the Low Average range.

In order to test the auditory memory ability of the five younger children who were assessed using the WPPSI-III, they were administered the Sentence Memory subtest from an earlier Wechsler intelligence test - the WPPSI-R. These five younger students were all found to have poor sentence memory ability. Two of these five students had sentence memory ability scores at the 1st percentile. These two students had Autistic Disorder. Another two of the five students had sentence memory ability scores at the 2nd percentile. One of these two students had Asperger's Disorder and the other had ASD-NOS. The other one of the five

students had a sentence memory ability score at the 5th percentile. This student had Autistic Disorder.

Differences between the Verbal Comprehension Index scores, the Perceptual Reasoning Index scores, and the Processing Speed Index scores of the students in the whole sample were analysed using paired-sample t tests. The Working Memory Index scores were not included in this analysis because of the smaller population size. Significant differences were found between the Verbal Comprehension Index and Perceptual Reasoning Index scores, t (17) = −2.477, p = .024, and between the Perceptual Reasoning Index and Processing Speed Index scores, t (17) = 2.763, p = .013. Considering the means of these scores, it followed that the Perceptual Reasoning Index scores were significantly higher than either the Verbal Comprehension Index scores or the Processing Speed Index scores.

The Full Scale IQ scores of the students in each autistic diagnostic category are shown as a boxplot in Figure 6.1. The pattern in the boxplots of each of their index scores is similar to the pattern in the boxplot of their Full Scale IQ scores.
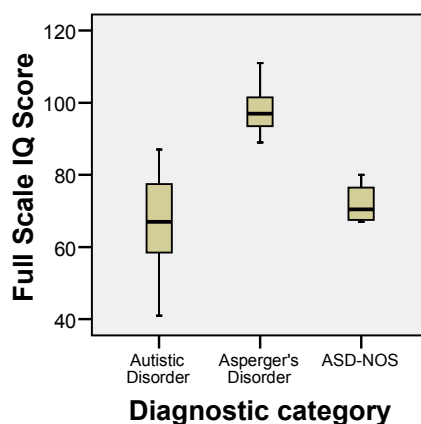
Figure 6.1. Full Scale IQ scores of students in each autistic diagnostic category.

Differences between the scores of the students in each autistic diagnostic category in relation to each of the indexes and the Full Scale IQ were analysed using a one-way between-groups analysis of variance (ANOVA). Table 6.2 sets

out the results. Post hoc comparisons using Tukey's HSD test indicated that the students with Asperger's Disorder had significantly higher Verbal Comprehension Index scores, Processing Speed Index scores, Working Memory Index scores, and Full Scale IQ scores than either the students with Autistic Disorder or the students with ASD-NOS.

Table 6.2

Results of One-way Between-Groups ANOVAs in Relation to Wechsler Intellectual Ability Standard Scores of Students in Each Autistic Diagnostic Category

Wechsler composite score	n	$F(2,15)$	p	Eta squared
Verbal Comprehension Index	18	16.286	.0005*	.68
Perceptual Reasoning Index	18	3.542	.055	-
Processing Speed Index	18	6.191	.011*	.45
		$F(2,10)$		
Working Memory Index	13	16.255	.001*	.76
		$F(2,15)$		
Full Scale IQ	18	13.658	.0005*	.65

*$p < .05$

Academic Ability

Reading Ability

The reading ability of the students in the sample was assessed using the Neale Analysis of Reading Ability – Third Edition. Assessments of the nine students in Group One and the nine students in Group Two were conducted by the writer before the implementation of the research model in relation to their respective groups. Descriptive statistics of the Reading Accuracy and Reading Comprehension percentile ranks of the students in the whole sample and in each autistic diagnostic category are set out in Table 6.3. Normality was assessed using the Shapiro-Wilks statistic.

The mean Reading Accuracy and Reading Comprehension percentile

Table 6.3

Descriptive Statistics of Neale Reading Ability Percentile Ranks of Students in Each Autistic Diagnostic Category and in Whole Sample

Neale assessment	Students with AD ($n = 7$)		Students with AS ($n = 7$)		Students with ASD-NOS ($n = 4$)		Whole sample ($n = 18$)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Reading Accuracy	17.43[a]	30.95	26.29	14.84	17.00	13.09	20.78[a]	21.60
Reading Comprehension	13.00[a]	21.95	35.00	22.75	8.25	6.75	20.50[a]	22.49

Note. AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified
[a] Percentile ranks not normally distributed (Shapiro-Wilk's statistic $p < .05$)

ranks of the students in the whole sample were both in the Below Average range. The performance descriptors for the total population of students are given in Table 6.4. Seven (39%) of the eighteen students in the sample were in the Average range

Table 6.4

Numbers of Students in Sample with Each Neale Reading Ability Performance Descriptor

Neale assessment	Performance descriptor				
	Very Low (1st - 10th percentile)	Below Average (11th - 23rd percentile)	Average (24th - 77th percentile)	Above Average (78th - 89th percentile)	Very High (90th- 100th percentile)
Reading Accuracy	7	3	7	1	0
Reading Comprehension	9	3	5	1	0

Note. n = 18

for Reading Accuracy but seven (39%) were in the Very Low range. Nine students (50%) were in the Very Low range for Reading Comprehension.

The Reading Accuracy and Reading Comprehension percentile ranks of the students in each autistic diagnostic category are shown as boxplots in Figures 6.2 and 6.3, respectively.
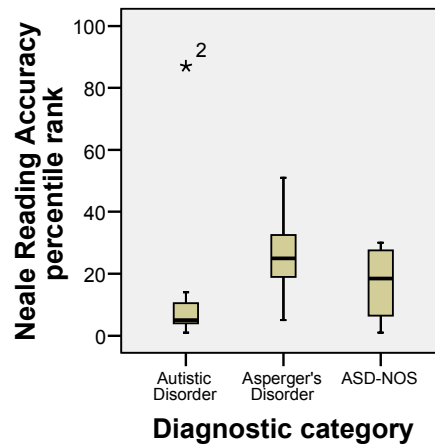
Figure 6.2. Neale Reading Accuracy percentile ranks of students in each autistic diagnostic category.
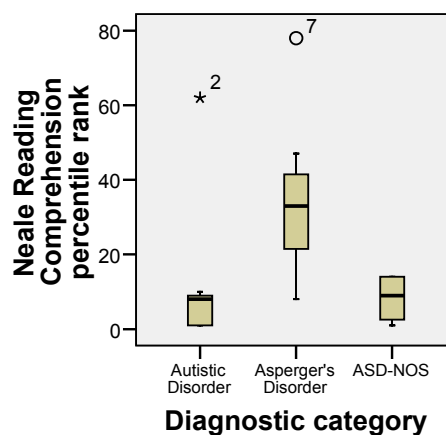
Figure 6.3. Neale Reading Comprehension percentile ranks of students in each autistic diagnostic category.

In Figure 6.2 there is a high outlier in the Above Average range in relation to Reading Accuracy for one student with Autistic Disorder. In Figure 6.3 this

student's Reading Comprehension percentile rank is also an outlier score in the Average range. In Fig. 6.3 there is also an outlier score in the Above Average range in relation to Reading Comprehension for one student with Asperger's Disorder.

Differences between the students in each autistic diagnostic category in relation to their Neale reading ability percentile ranks were analysed using one-way between-groups ANOVAs. The outlier Reading Accuracy percentile rank and the two outlier Reading Comprehension percentile ranks were removed before conducting the ANOVAs. With these outliers removed, both the Reading Accuracy and Reading Comprehension percentile ranks were found to be normally distributed. Table 6.5 sets out the results. Significant differences between the students in each autistic diagnostic category were found in relation to Reading Accuracy and Reading Comprehension. Post hoc comparisons using Tukey's HSD test indicated that the students with Asperger's Disorder had significantly higher Reading Accuracy percentile ranks than the students with Autistic Disorder and significantly higher Reading Comprehension percentile ranks than either the students with Autistic Disorder or the students with ASD-NOS.

Table 6.5

Results of One-way Between-Groups ANOVAs in Relation to Neale Reading Ability Percentile Ranks of Students in Each Autistic Diagnostic Category

Neale assessment	n	$F_{(2,14)}$	p	Eta squared
Reading Accuracy	17	4.886	.025*	.41
		$F_{(2,13)}$		
Reading Comprehension	16	9.868	.002*	.60

* $p < .05$

Academic Achievement in Word Reading, Written Expression and Mathematical Reasoning

The academic achievement of the students in the sample was assessed using the WIAT-II. Assessments of the nine students in Group One and the nine

students in Group Two were conducted by the writer before the implementation of the research model in relation to their respective groups. Descriptive statistics of the Word Reading, Written Expression, and Maths Reasoning subtest standard scores of the students in the whole sample and in each autistic diagnostic category are set out in Table 6.6. The means are also given as percentiles. The mean Word Reading standard score of the students in the whole sample was in the Low Average range, their mean Written Expression standard score was in the Very Low range, and their mean Maths Reasoning standard score was in the Low Average range.

Table 6.6

Descriptive Statistics of WIAT-II Subtest Standard Scores of Students in Each Autistic Diagnostic Category and in Whole Sample

WIAT-II subtest	Students with AD ($n = 7$)		Students with AS ($n = 7$)		Students with ASD-NOS ($n = 4$)		Whole sample ($n = 18$)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Word Reading	77.71 (7th percentile)	29.57	93.00 (32nd percentile)	7.39	84.00 (14th percentile)	25.07	85.06 (16th percentile)	22.07
Written Expression	69.14 (2nd percentile)	20.95	66.43^{a} (1st percentile)	10.42	65.75 (1st percentile)	22.36	67.33 (1st percentile)	16.85
Maths Reasoning	72.00 (3rd percentile)	16.75	103.43 (58th percentile)	7.59	82.50 (13th percentile)	18.16	86.56 (19th percentile)	19.65

Note. AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified
[a] Scores not normally distributed (Shapiro-Wilk's statistic $p < .05$)

The WIAT-II Word Reading, Written Expression, and Maths Reasoning subtest standard scores of the students in each autistic diagnostic category are shown as boxplots in Figures 6.4, 6.5, and 6.6, respectively.

Differences between the students in each autistic diagnostic category in relation to the WIAT-II subtest standard scores were analysed using one-way between-groups ANOVAs. As noted in the preceding section, one student with
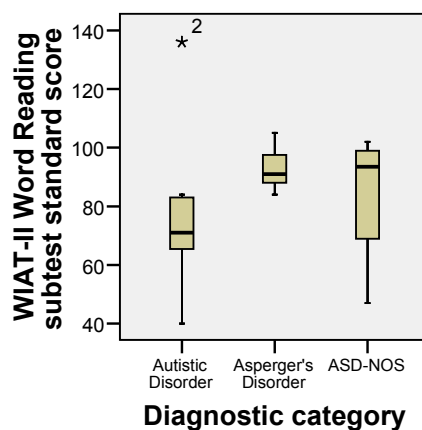
Figure 6.4. WIAT-II Word Reading subtest standard scores for students in each autistic diagnostic category.
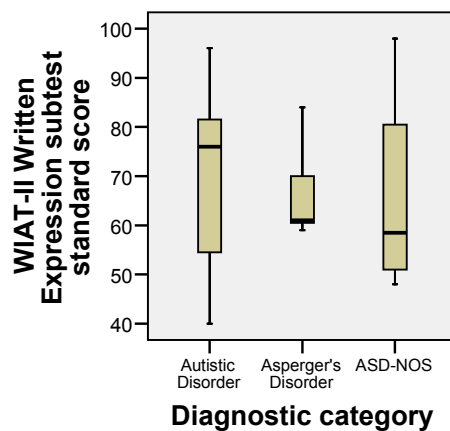
Figure 6.5. WIAT-II Written Expression subtest standard scores for students in each autistic diagnostic category.
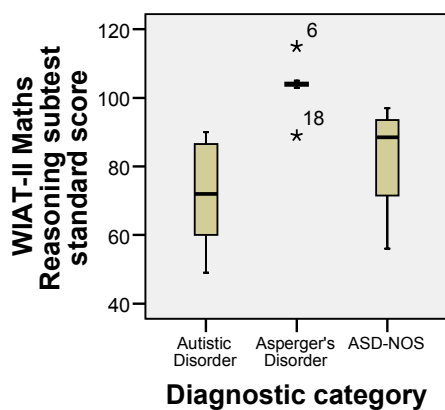
Figure 6.6. WIAT-II Maths Reasoning subtest standard scores for students in each autistic diagnostic category.

Autistic Disorder was shown to have Above Average reading ability using the Neale. This student scored in the Above Average range in the WIAT-II Word Reading subtest. This outlier was removed before conducting the ANOVA in relation to this subtest. Table 6.7 sets out the results of the ANOVAs. Significant differences between the students in each autistic diagnostic category were found in relation to the Word Reading and Mathematical Reasoning subtests. Post hoc comparisons using Tukey's HSD test indicated that the students with Asperger's Disorder had significantly higher Word Reading and Mathematical Reasoning standard scores than the students with Autistic Disorder.

Table 6.7

Results of One-way Between-groups ANOVAs in Relation to WIAT-II Academic Achievement Scores of Students in Each Autistic Diagnostic Category

WIAT-II subtest	*n*	*F*(2,14)	*p*	*Eta squared*
Word Reading	17	4.083	.040*	.37
		F(2,15)		
Written Expression	18	.061	.941	
Mathematical Reasoning	18	8.799	.003*	.54

*$p < .05$

Academic Achievement Scores in Relation to Predicted Achievement Scores

Whether a student's academic achievement score in any WIAT-II subtest was significantly higher than, not significantly different to, or significantly lower than their predicted achievement score based on their Wechsler Full Scale IQ score was determined on the basis of the achievement-discrepancy tables provided in the WIAT-II *Technical Manual* (Wechsler, 2007). Those students whose WIAT-II academic achievement scores in a particular area were significantly lower than their predicted achievement scores were understood to have a Specific Learning Disability in that area. The numbers of students in the whole sample and in each autistic diagnostic category whose WIAT-II academic achievement scores were significantly higher than, not significantly different to, or significantly lower than their predicted achievement scores are set out in Table 6.8.

Table 6.8

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample whose WIAT-II Academic Achievement Scores were Higher Than, Not Different To, or Lower Than Predicted Achievement Scores

WIAT-II subtest	Relation of Achievement Score to Predicted Score[a]	Students with AD (*n* = 7)	Students with AS (*n* = 7)	Students with ASD-NOS (*n* = 4)	Whole sample (*n* = 18)
Word Reading	Higher	3	1	3	7
	Not different	2	2	0	4
	Lower	2	4	1	7
Written Expression	Higher	0	0	1	1
	Not different	4	0	0	4
	Lower	3	7	3	13
Maths Reasoning	Higher	1	1	2	4
	Not different	5	6	1	12
	Lower	1	0	1	2

Note. AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified
[a] Higher = Significantly higher than that predicted by IQ to a .05 level, Not different = Not significantly different to that predicted by IQ, Lower = Significantly lower than that predicted by IQ to a .05 level

In relation to Word Reading, seven (39%) of the eighteen students in the sample performed significantly higher than predicted by their intellectual ability, including three (75%) of the four students with ASD-NOS and three (43%) of the seven students with Autistic Disorder, but seven (39%) of the eighteen students from the sample performed significantly *lower* than predicted, including four (57%) of the seven students with Asperger's Disorder. These students had a Specific Learning Disability in relation to reading.

In relation to Written Expression, thirteen (72%) of the eighteen students performed significantly *lower* than predicted, including all seven (100%) of the seven students with Asperger's Disorder and three (75%) of the four students with ASD-NOS. These students had a Specific Learning Disability in relation to

Written Expression. However, four (57%) of the seven students with Autistic Disorder performed as predicted by their intellectual ability.

In relation to Mathematical Reasoning, twelve (67%) of the eighteen students performed as predicted by their intellectual ability, including six (86%) of the seven students with Asperger's Disorder and five (71%) of the seven students with Autistic Disorder, but two (50%) of the four students with ASD-NOS performed significantly higher than predicted.

Autistic Behaviours

Behavioural abnormalities that are particularly related to autism were assessed using the Rated Disco Items. The Rated Disco Items were administered two times with regard to Group One students and three times with regard to Group Two students. The first administration of the Rated Disco Items was included in the administration of the full DISCO with regard to both Group One and Group Two students at the beginning of Period 1. The Rated Disco Items were administered a second time with regard to both Group One students and Group Two students at the end of Period 1. The Rated Disco Items were administered a third time with regard to Group Two students at the end of Period 2. For the purposes of this chapter, only the Rated Disco Item assessments that were conducted for Group One students and Group Two students at the beginning of Period 1 will be considered and only the domain scores and Total Rated Disco Items scores will be considered. Descriptive statistics of the domain scores and Total Rated Disco Items scores of the students in each autistic diagnostic category are set out in Table 6.9.

Differences between the students in each autistic diagnostic category in relation to their Rated Disco Items domain scores and their Total Rated Disco Items scores were analysed using one-way between-groups ANOVAs. Table 6.10 sets out the results. A significant difference between the students in each autistic diagnostic category was found in relation to in the Maladaptive Behaviours domain. Post hoc comparisons using Tukey's HSD test indicated that the students with Autistic Disorder had significantly lower Maladaptive Behaviours scores than either the students with Asperger's Disorder or the students with ASD-NOS.

Table 6.9

Descriptive Statistics of Rated Disco Items Scores of Students in Each Autistic Diagnostic Category

Rated Disco Items domain	Students with AD ($n = 7$)		Students with AS ($n = 7$)		Students with ASD-NOS ($n = 4$)	
	Mean	SD	Mean	SD	Mean	SD
Self-Care	29.57	5.97	27.57	7.04	28.50	6.90
Communication	41.50	4.15	43.16	8.01	38.58	4.58
Social Interaction	88.86	11.21	85.10	18.50	75.00	8.29
Repetitive, Stereotyped Activities	119.43	6.16	150.14	36.32	130.75	22.88
Maladaptive Behaviour	40.57	6.68	60.14	10.14	54.75	4.65
Total Rated Disco Items[a]	382.17	29.01	433.73	78.42	388.45	31.11

Note. All scores normally distributed (Shapiro-Wilk's statistic p > .05), AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified
[a] Total Rated Disco Items includes *Other* sub-domains

Table 6.10

Results of One-way Between-groups ANOVA in Relation to Rated Disco Items Scores of Students in Each Autistic Diagnostic Category

Rated Disco Items domain	$F (2,15)$	p	Eta squared
Self-care	.164	.850	
Communication	.728	.499	
Social Interaction	1.234	.319	
Repetitive Stereotyped Activities	2.589	.108	
Maladaptive Behaviours	11.066	.001*	.60
Total Rated Disco Items	1.754	.207	

Note. n = 18. Total Rated Disco Items includes *Other* sub-domains.
* *p* < .05

The Rated Disco Items domain scores and Total Rated Disco Items scores of the students in each autistic diagnostic category are shown as boxplots in Figures 6.7 to 6.12 respectively.
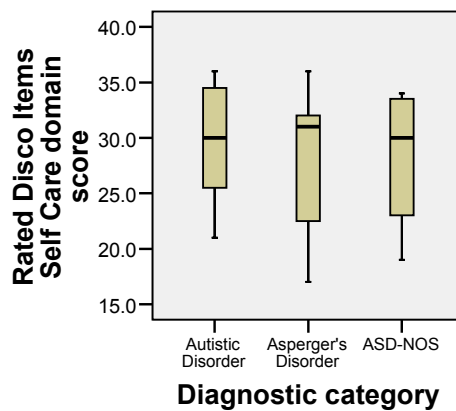
Figure 6.7. Rated Disco Items Self-Care domain scores of students in each autistic diagnostic category.
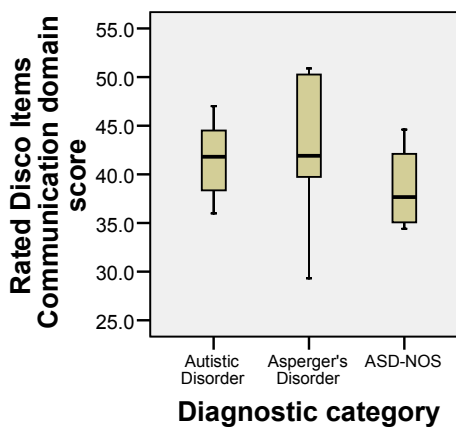
Figure 6.8. Rated Disco Items Communication domain scores of students in each autistic diagnostic category.
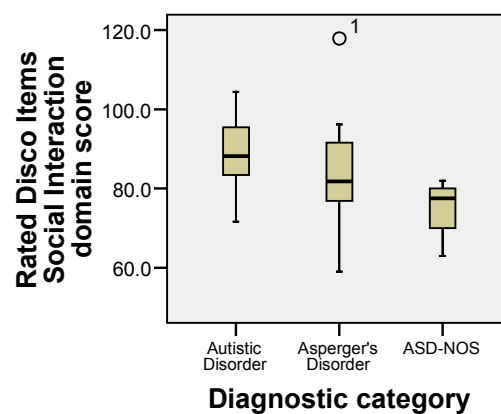
Figure 6.9. Rated Disco Items Social Interaction domain scores of students in each autistic diagnostic category.
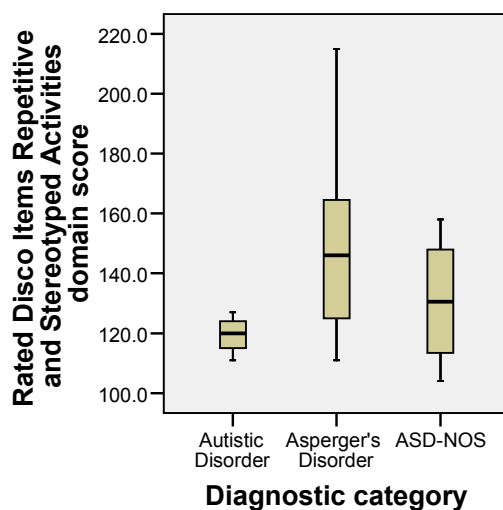
Figure 6.10. Rated Disco Items Repetitive, Stereotyped Activities domain scores of students in each autistic diagnostic category.
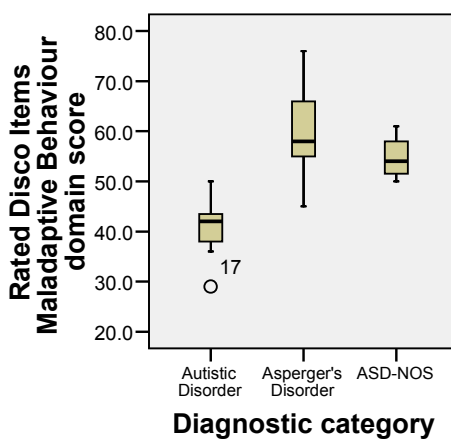
Figure 6.11. Rated Disco Items Maladaptive Behaviours domain scores of students in each autistic diagnostic category.
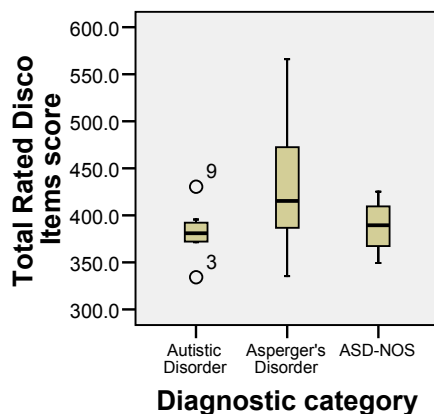
Figure 6.12. Total Rated Disco Items scores of students in each autistic diagnostic category.

Executive Functioning

The executive functioning ability of the students in the sample was assessed using the BRIEF (Teacher form). Assessments were conducted for Group One students and Group Two students both before and after the implementation of the research model in relation to their respective groups. For the purposes of this chapter, only the assessments which were conducted before the implementation of the research model will be considered. Descriptive statistics of the BRIEF Teacher Form clinical scale T scores, index composite T scores, and global composite T scores of the students in the whole sample and in each autistic diagnostic category are set out in Table 6.11. These scores were normally distributed except as indicated.

Table 6.11

Descriptive Statistics of BRIEF Teacher Form T Scores of Students in Each Autistic Diagnostic Category and in Whole sample

BRIEF Teacher Form clinical scale or composite	Students with AD ($n = 7$)		Students with AS ($n = 7$)		Students with ASD-NOS ($n = 4$)		Whole sample ($n = 18$)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Inhibit	51.71	7.30	61.14	11.45	60.00	3.74	57.22	9.39
Shift	70.00	15.12	71.00	10.82	75.75	19.62	71.67	13.97
Emotional Control	63.14	13.37	65.43	7.93	61.25	5.85	63.61	9.75
Behaviour Regulation Index	61.57	12.03	67.71	9.55	66.75	6.13	65.11	9.92
Initiate	69.71	10.61	69.00	10.10	72.75	7.41	70.11	9.36
Working Memory	71.29	10.50	65.71	8.94	79.50	7.51	70.94	10.28
Plan/Organise	69.14	11.88	70.86	6.89	72.00	6.38	70.44	8.67
Organisation of Materials	59.86	8.53	68.14	10.07	67.25	7.41	64.72	9.34
Monitor	60.29	6.47	70.29	9.41	74.50	6.25	67.33	9.44
Metacognition Index	67.14	8.71	70.57	7.89	76.00	6.16	70.44	8.20
Global Executive Composite	65.86	8.21	71.14[a]	7.71	74.50[a]	3.70	69.83	7.72

Note. AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified

[a] Scores not normally distributed (Shapiro-Wilk's statistic $p < .05$)

The numbers of students in the whole sample and in each autistic category with BRIEF Teacher Form clinical scale, index composite, or global composite *T* scores in the clinical range are set out in Table 6.12.

Table 6.12

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample with BRIEF Teacher Form T scores in Clinical Range

BRIEF Teacher Form clinical scale or composite	Students with AD (*n* = 7)	Students with AS (*n* = 7)	Students with ASD-NOS (*n* = 4)	Whole sample (*n* = 18)
Inhibit	0	3	0	3
Shift	4	6	2	12
Emotional Control	2	4	1	7
Behaviour Regulation Index	3	5	3	11
Initiate	3	5	3	11
Working Memory	5	5	4	14
Plan/Organise	4	6	4	14
Organisation of Materials	1	5	3	9
Monitor	3	5	4	12
Metacognition Index	4	6	4	14
Global Executive Composite	5	6	4	15

Note. AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autism Spectrum Disorder – Not Otherwise Specified

These results indicated that fifteen (83%) of the eighteen students in the sample had Global Executive Composite *T* scores in the clinical range. The results regarding the two indices indicated that fourteen (78%) of the eighteen students had Metacognition Index *T* scores in the clinical range and eleven (61%) of the eighteen students Behavioural Regulation Index *T* scores in the clinical range. In addition, more than half of the students in the sample had *T* scores in the clinical range for five of the eight clinical scales.

In relation to the number of students in the clinical range according to autistic diagnostic category, more than half of the students with Asperger's Disorder had *T* scores in the clinical range for the Global Executive Composite, for both indices, and for seven of the eight clinical scales. All of the students with ASD-NOS had *T* scores in the clinical range for the Global Executive Composite, the Metacognition Index, and three of the clinical scales. Also, more than half of the students with ASD-NOS had *T* scores in the clinical range for the Behavioural Regulation Index and for two of the other five clinical scales. It was also found that more than half of the students with Autistic Disorder had *T* scores in the clinical range for the Global Executive Composite, the Metacognition Index, and for three of the eight clinical scales.

Differences between the students in each autistic diagnostic category in relation to their BRIEF Teacher Form *T* scores were analysed using one-way between groups ANOVAs. The results are set out in Table 6.13. No significant

Table 6.13
Results of the One-way Between Groups ANOVAs in Relation to BRIEF Teacher Form T Scores of Students in Each Autistic Diagnostic Category

BRIEF Teacher Form clinical scale or composite	F (2,15)	p	Eta squared
Inhibit	2.291	.135	
Shift	.207	.815	
Emotional Control	.224	.802	
Behaviour Regulation Index	.716	.505	
Initiate	.194	.826	
Working Memory	2.778	.094	
Plan/Organise	.136	.874	
Organisation of Materials	1.692	.217	
Monitor	5.119	.020*	.41
Metacognition Index	1.590	.236	
Global Executive Composite[a]	2.525	.113	

Note. n = 18
[a] Results after reflect and inverse transformation
**p* < .05

differences were found between the students in each autistic diagnostic category in relation to any composite score or clinical scale other than the Monitor clinical scale. Post hoc analysis using Tukey's HSD test indicated that students with ASD-NOS had significantly higher Monitor *T* scores than students with Autistic Disorder.

The BRIEF Global Executive Composite *T* scores and the Monitor clinical scale *T* scores are set out as boxplots in Figures 6.13 and 6.14, respectively.
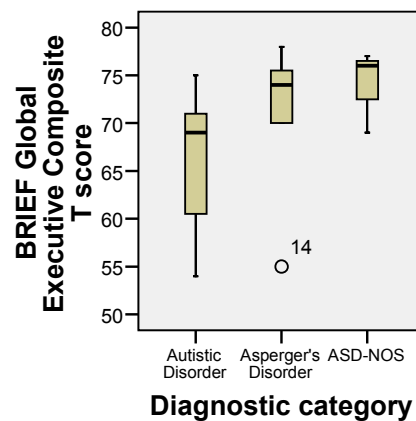
Figure 6.13. BRIEF Teacher Form Global Executive Composite *T* scores of students in each autistic diagnostic category.
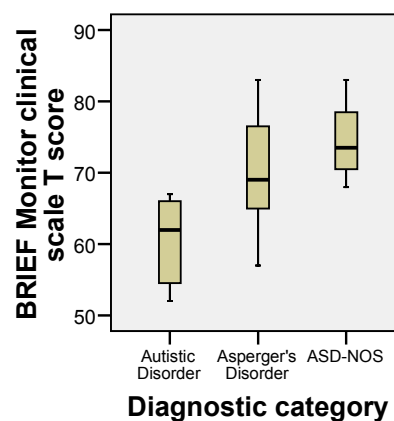
Figure 6.14. BRIEF Teacher Form Monitor clinical scale *T* scores of students in each autistic diagnostic category.

Problem Behaviours

The problem behaviours of the students in the sample were assessed using both the ASEBA-TRF and the ASEBA-CBCL. Assessments were conducted for Group One students and Group Two students both before and after the implementation of the research model in relation to their respective groups. For the purposes of this chapter, only the assessments which were conducted before the implementation of the research model will be considered. Descriptive statistics of the ASEBA-TRF and ASEBA-CBCL syndrome scale T scores, grouping of syndrome T scores, and total T scores of the students in the whole sample and in each autistic diagnostic category are set out in Tables 6.14 and 6.15, respectively. The scores were found to be normally distributed except as indicated.

Table 6.14

Descriptive Statistics of ASEBA-TRF T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample

ASEBA-TRF syndrome scale or grouping of syndromes	Students with AD ($n = 7$)		Students with AS ($n = 7$)		Students with ASD-NOS ($n = 4$)		Whole sample ($n = 18$)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Anxious/Depressed	64.57[a]	10.49	67.00	8.58	59.00	10.83	64.28	9.76
Withdrawn/Depressed	62.86	11.38	58.71	6.82	57.00	6.48	59.94[a]	8.70
Somatic Complaints	55.14[a]	7.56	57.29[a]	10.81	60.75	8.69	57.22[a]	8.91
Social Problems	62.00	5.66	61.00	5.03	60.25[a]	7.81	61.22	5.61
Thought Problems	68.86	11.47	65.29	10.36	64.00	13.37	66.39	10.96
Attention Problems	59.71	3.77	61.14	6.07	66.00	5.83	61.67	5.49
Rule-Breaking Behaviour	54.29	4.54	57.29	4.54	55.00	3.74	55.61[a]	4.35
Aggressive Behaviour	58.00	7.26	58.43	5.59	60.50[a]	.58	58.72	5.54
Internalising	62.86[a]	11.51	65.00	6.63	60.50	14.20	63.17	10.05
Externalising	56.43	7.37	58.29	5.19	59.50[a]	.58	57.83	5.50
Total Problems	62.43	7.64	63.86	4.71	63.50	6.56	63.22	6.04

Note. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other, AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified

[a] Scores not normally distributed (Shapiro-Wilks statistic $p < .05$)

Table 6.15

Descriptive Statistics of ASEBA-CBCL T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample

ASEBA-CBCL syndrome scale or grouping of syndromes	Students with AD (*n* = 7)		Students with AS (*n* = 7)		Students with ASD-NOS (*n* = 4)		Whole sample (*n* = 18)	
	Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Anxious/Depressed	53.71[a]	5.16	73.00	11.53	64.75	10.47	63.67	12.35
Withdrawn/Depressed	61.43	6.88	67.43	9.43	58.00	4.32	63.00	8.15
Somatic Complaints	55.29[a]	7.20	66.14	10.29	67.75	6.24	62.28	9.79
Social Problems	58.57	1.40	72.14	7.52	73.00	2.45	67.06[a]	8.38
Thought Problems	64.43	6.55	74.14	10.73	73.00	5.10	70.11	9.07
Attention Problems	68.00	6.16	67.43	5.65	79.25	8.66	70.28	7.90
Rule-Breaking Behaviour	51.86[a]	2.48	66.71	5.31	66.00	6.06	60.78[a]	8.50
Aggressive Behaviour	57.29	7.93	72.14	9.60	70.25	4.65	65.94	10.47
Internalising	56.43	7.96	72.14	9.96	66.25	6.19	64.72	10.75
Externalising	52.57	11.82	70.29	6.47	70.50	1.29	63.44[a]	12.00
Total Problems	58.71[a]	6.85	73.71[a]	7.16	73.00	1.63	67.72[a]	9.48

Note. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other, AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified

[a] Scores not normally distributed (Shapiro-Wilks statistic *p* < .05)

The numbers of students in the whole sample and in each autistic diagnostic category with syndrome scale, grouping of syndromes, and total *T* scores in the clinical range are set out for the ASEBA-TRF in Table 6.16 and for the ASEBA-CBCL in Table 6.17.

In relation to the number of students indicated to have problem behaviours in the clinical range according to teacher report in the ASEBA-TRF, the highest result indicated that eleven (61%) of the eighteen students had *T* scores in the clinical range for the Internalising grouping of syndromes. This included more than half of the students with Autistic Disorder, more than half of the students with Asperger's Disorder and half of the students with ASD-NOS. The next highest result was for the Total Problems. It was indicated that more than half of

Table 6.16

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample with ASEBA-TRF T scores in Clinical Range

ASEBA-TRF syndrome scale or grouping of syndromes	Students with AD (*n* = 7)	Students with AS (*n* = 7)	Students with ASD-NOS (*n* = 4)	Whole sample (*n* = 18)
Anxious/Depressed	2	4	1	7
Withdrawn/Depressed	1	0	0	1
Somatic Complaints	1	1	1	3
Social Problems	1	0	0	1
Thought Problems	3	2	1	6
Attention Problems	0	0	1	1
Rule-Breaking Behaviour	0	0	0	0
Aggressive Behaviour	0	0	0	0
Internalising	5	4	2	11
Externalising	2	1	0	3
Total Problems	2	4	2	8

Note. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other, AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified

the students with Asperger's Disorder, and half of the students with ASD-NOS had Total Problems in the clinical range.

In relation to the ASEBA-CBCL, the results indicated that eleven (61%) of the eighteen students had *T* scores in the clinical range for Total Problems. This included more than half of the students with Asperger's Disorder (86%) and all of the students with ASD-NOS. It was also indicated that eleven (61%) of the eighteen students had *T* scores in the clinical range for the Externalising grouping of syndromes. This also included more than half of the students with Asperger's Disorder (86%) and all of the students with ASD-NOS. The Internalising

Table 6.17

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample with ASEBA-CBCL T scores in Clinical Range

ASEBA-CBCL syndrome scale or grouping of syndromes	Students with AD (*n* = 7)	Students with AS (*n* = 7)	Students with ASD-NOS (*n* = 4)	Whole sample (*n* = 18)
Anxious/Depressed	0	5	1	6
Withdrawn/Depressed	1	3	0	4
Somatic Complaints	1	3	1	5
Social Problems	0	5	4	9
Thought Problems	1	4	3	8
Attention Problems	3	2	3	8
Rule-Breaking Behaviour	0	3	2	5
Aggressive Behaviour	1	5	2	8
Internalising	1	6	2	9
Externalising	1	6	4	11
Total Problems	1	6	4	11

Note. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other, AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder − Not Otherwise Specified

grouping of syndromes indicated that half of the whole sample of students had problems in this area to a clinical range. This included more than half of the students with Asperger's Disorder (86%) and half of the students with ASD-NOS. It was apparent from parent responses that students with Autistic Disorder were much less often indicated to be in the clinical range across a number of problem behaviours. The highest indication of problem area for students with Autistic Disorder was in relation to Attention Problems in which three of the seven students (43%) were indicated to have difficulty in the clinical range.

Differences between the ASEBA-TRF *T* scores and the ASEBA-CBCL *T* scores of the students in the sample in each syndrome scale, in each grouping of syndromes, and in total were analysed using paired-samples *t* tests. The results are set out in Table 6.18. ASEBA-CBCL *T* scores were significantly higher than the ASEBA-TRF *T* scores for the Attention Problems, Aggressive Behaviour, Rule-Breaking Behaviour, and Social Problems syndrome scales.

Table 6.18

Results of Paired-Samples t Test Comparing ASEBA-TRF and ASEBA-CBCL T scores of Students in Whole Sample

ASEBA syndrome scale or grouping of syndromes	*t*	*p*
Anxious/Depressed	.191	.851
Withdrawn/Depressed	-1.380	.186
Somatic Complaints	-1.861	.080
Social Problems	-2.746	.014*
Thought Problems	-1.470	.160
Attention Problems	-6.068	.0005*
Rule-Breaking Behaviour	-2.901	.010*
Aggressive Behaviour	-2.965	.009*
Internalising	-.549	.590
Externalising	-2.110	.050
Total Problems	-2.068	.054

Note. $n = 18$. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other
* $p < .05$

Differences between the students in each autistic diagnostic category in relation to their ASEBA-TRF and the ASEBA-CBCL *T* scores were analysed using one-way between groups ANOVAs. In the ASEBA-TRF and ASEBA-CBCL data some syndrome scale scores and grouped scores were not normally distributed. These were transformed satisfactorily to achieve normality where

possible. Results of the ANOVAs are set out in Tables 6.19 and 6.20, respectively.

No significant differences between the students in each autistic diagnostic category were found in relation to their ASEBA-TRF scores (Table 6.19). With the Somatic Complaints syndrome score, Aggressive Behaviour syndrome score, and Externalising grouping of syndrome score normality was not able to be achieved by transformation. Non-parametric analysis using the Kruskal-Wallis Test indicated that there were also no significant differences between the students in any autistic diagnostic category in relation to these syndrome scores. Results were Somatic Complaints (Chi square 1.24, $p = .539$), Aggressive Behaviour (Chi square 2.50, $p = .539$), and Externalising (Chi square 2.04, $p = .361$).

Table 6.19
Results of One-Way Between Groups ANOVAs in Relation to ASEBA-TRF T Scores of Students in Each Autistic Diagnostic Category

ASEBA-TRF syndrome scale or grouping of syndromes	$F(2,15)$	p
Anxious/Depressed[b]	.625	.548
Withdrawn/Depressed	.664	.529
Somatic Complaints[a]	-	-
Social Problems[c]	.151	.861
Thought Problems	.282	.758
Attention Problems	1.905	.183
Rule-Breaking Behaviour	.868	.440
Aggressive Behaviour[a]	-	-
Internalising[d]	.173	.843
Externalising[a]	-	-
Total Problems	.092	.912

Note. $n = 18$. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other
[a] Scores not normally distributed and not able to be transformed satisfactorily
[b] Results after reflect and inverse transformation
[c] Results after inverse transformation
[d] Results after reflect and square root transformation

Table 6.20

Results of One-Way Between Groups ANOVAs in Relation to ASEBA-CBCL

T Scores of Students in Each Autistic Diagnostic Category

ASEBA-CBCL syndrome scale or grouping of syndromes	F (2,15)	p	Eta squared
Anxious/Depressed[b]	9.278	.002 *	.50
Withdrawn/Depressed	2.186	.147	
Somatic Complaints[b]	4.811	.024 *	.35
Social Problems	16.816	.000*	.69
Thought Problems	2.727	.098	
Attention Problems	4.831	.024*	.39
Rule-Breaking Behaviour[a]	-	-	-
Aggressive Behaviour	6.542	.009*	.47
Internalising	6.033	.012*	.45
Externalising	9.283	.002*	.55
Total Problems[a]	-	-	-

Note. n = 18. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other
[a] Scores not normally distributed and not able to be transformed satisfactorily
[b] Results after inverse transformation
* p < .05

However, significant differences between the students in each autistic diagnostic category were found in relation to their ASEBA-CBCL scores (Table 6.20) in a number of syndrome scales and groupings of syndromes. Post hoc analysis using Tukey's HSD test was undertaken. In relation to the Anxious/Depressed syndrome scale, it was found that students with Asperger's Disorder had significantly higher scores than students with Autistic Disorder. In relation to the Somatic Complaints syndrome scale, it was found that students with ASD-NOS and students with Asperger's Disorder both had significantly higher scores than students with Autistic Disorder. In relation to the Social Problems syndrome scale, it was found that students with Asperger's Disorder and students with ASD-NOS both had significantly higher scores than students with Autistic Disorder. In relation to the Attention Problems syndrome scale, it was

found that students with ASD-NOS had significantly higher scores than both students with Asperger's Disorder and students with Autistic Disorder. In relation to the Aggressive Behaviour syndrome scale, it was found that students with Asperger's Disorder had significantly higher scores than students with Autistic Disorder. In relation to the Internalising grouping of syndromes, it was found that students with Asperger's Disorder had significantly higher scores than students with Autistic Disorder. In relation to the Externalising grouping of syndromes, it was found that students with Asperger's Disorder and students with ASD-NOS both had significantly higher scores than students with Autistic Disorder.

With the Rule-Breaking Behaviour syndrome scale scores and the Total Problems scores, normality was not able to be achieved by transformation because the data was bi-polar and was normally distributed around both the lower scores and the higher scores. However, considering the numbers of students in each autistic diagnostic category with scores in the clinical range (as set out in Table 6.17) it was found that three students with Asperger's Disorder and two students with ASD-NOS but no students with Autistic Disorder had Rule-Breaking Behaviours syndrome scale scores in the clinical range and that six students with Asperger's Disorder and four students with ASD-NOS but only one student with Autistic Disorder had Total Problems scores in the clinical range. That is, more students with Asperger's Disorder and more students with ASD-NOS than students with Autistic Disorder had Rule-Breaking Behaviour scores and Total Problems scores in the clinical range.

Non-parametric analysis of the ASEBA-CBCL scores using the Kruskal-Wallis Test indicated a significant difference between the students in each autistic diagnostic category in relation to the Rule-Breaking Behaviour syndrome scale scores (Chi square, 11.99; $p = .002$) and Total Problems scores (Chi square, 10.23; $p = .006$). Inspection of the mean ranks and post hoc analysis indicated that students with Asperger's Disorder and students with ASD-NOS both had significantly higher scores than students with Autistic Disorder.

The ASEBA-TRF and ASEBA-CBCL Total Problems T scores, Social Problems syndrome scale T scores, Attention Problems syndrome scale T scores, and Aggressive Behaviour syndrome scale T scores are set out as boxplots in Figure 6.15 and 6.16, 6.17 and 6.18, 6.19 and 6.20, and 6.21 and 6.22, respectively.
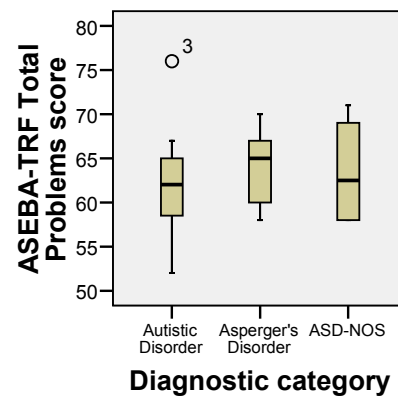
Figure 6.15. ASEBA-TRF Total Problems *T* scores of students in each autistic diagnostic category.
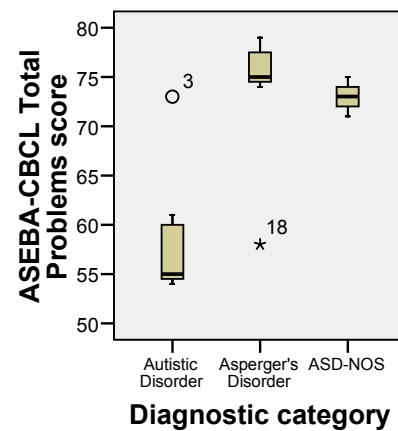
Figure 6.16. ASEBA-CBCL Total Problems *T* scores of students in each autistic diagnostic category.
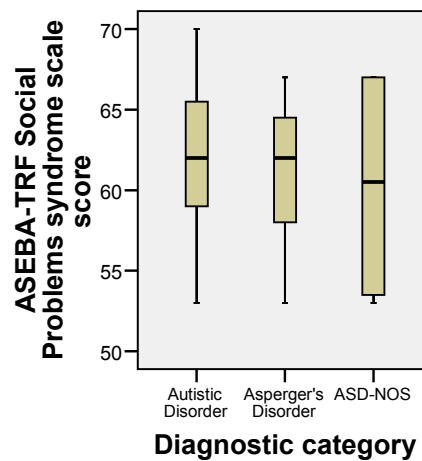
Figure 6.17. ASEBA-TRF Social Problems syndrome scale *T* scores of students in each autistic diagnostic category.
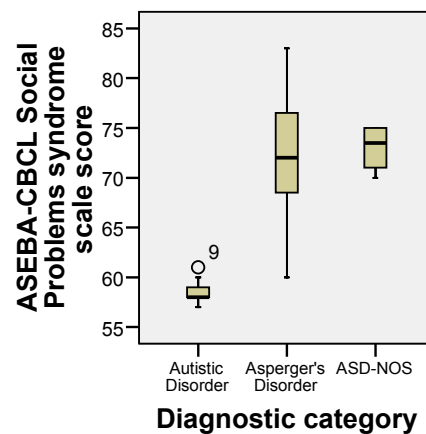
Figure 6.18. ASEBA-CBCL Social Problems syndrome scale *T* scores of students in each autistic diagnostic category.
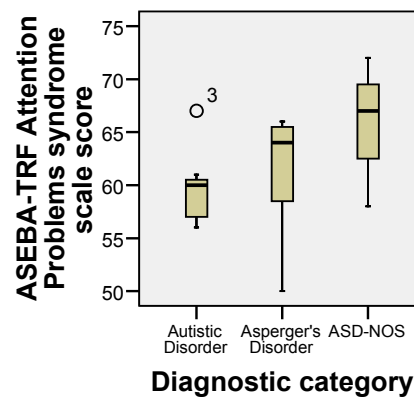
Figure 6.19. ASEBA-TRF Attention Problems syndrome scale *T* scores of students in each autistic diagnostic category.
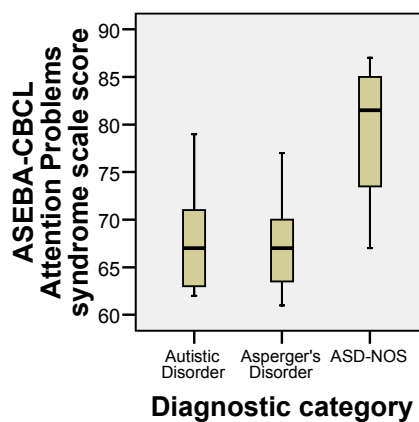
Figure 6.20. ASEBA-CBCL Attention Problems syndrome scale *T* scores of students in each autistic diagnostic category.
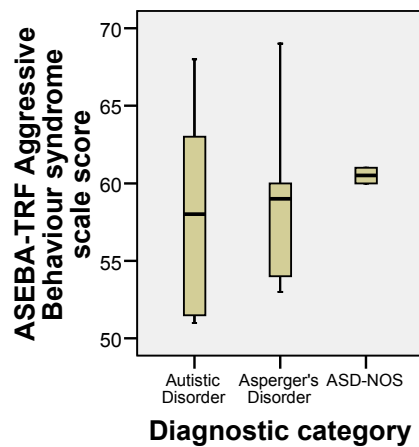
Figure 6.21. ASEBA-TRF Aggressive Behaviour syndrome scale *T* scores of students in each autistic diagnostic category.
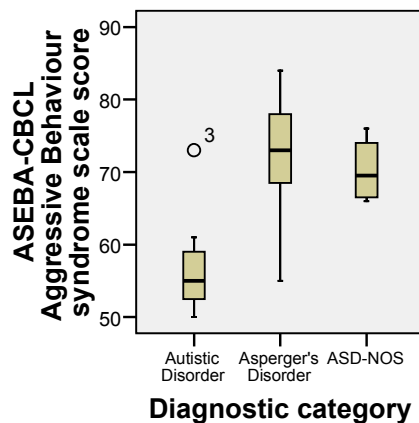
Figure 6.22. ASEBA-CBCL Aggressive Behaviour syndrome scale *T* scores of students in each autistic diagnostic category.

Sensory Responses

The sensory responses of the students in the sample were assessed using the Sensory Profile: Caregiver Questionnaire (Dunn, 1999). Assessments of the nine students in Group One and the nine students in Group Two were conducted by the writer before the implementation of the research model in relation to their respective groups. The numbers of students in the whole sample and in each autistic diagnostic category with section results and factor results showing a

definite difference between their sensory responses and the responses of a normal population are set out for each section in Table 6.21 and for each factor in Table 6.22.

Table 6.21

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample with Sensory Profile Section Results Showing a Definite Difference

Sensory Profile section	Students with AD ($n = 7$)	Students with AS ($n = 7$)	Students with ASD-NOS ($n = 4$)	Whole sample ($n = 18$)
Auditory Processing	3	4	4	11
Visual Processing	1	2	2	5
Vestibular Processing	1	4	2	7
Touch Processing	1	3	2	6
Multisensory Processing	3	5	3	11
Oral Sensory Processing	1	5	1	7
Sensory Processing Related to Endurance /Tone	3	3	3	9
Modulation Related to Body Position and Movement	0	2	3	5
Modulation of Movement Affecting Activity Level	3	2	1	6
Modulation of Sensory Input Affecting Emotional Responses	1	5	4	10
Modulation of Visual Input Affecting Emotional Responses and Activity Level	1	0	2	3
Emotional/Social Responses	1	7	4	12
Behavioural Outcomes of Sensory Processing	4	5	3	12

With regard to the Sensory Profile sections, more than half of the sample had a definite difference in Auditory Processing, Multisensory Processing, Modulation of Sensory Input Affecting Emotional Responses, Emotional/Social Responses, and Behavioural Outcomes of Sensory Processing. All of the students with Asperger's Disorder had a definite difference in Emotional/Social Responses and more than half had a definite difference in six other sections. All of the students with ASD-NOS had a definite difference in Auditory Processing, Modulation of Sensory Input Affecting Emotional Responses, and Emotional/Social Responses and more than half had a definite difference in four other sections. More than half of the students with Autistic Disorder had a definite difference in the Behavioural Outcomes of Sensory Processing section.

Table 6.22

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample with Sensory Profile Factor Results Showing a Definite Difference

Sensory Profile factor	Students with AD ($n = 7$)	Students with AS ($n = 7$)	Students with ASD-NOS ($n = 4$)	Whole sample ($n = 18$)
Sensory Seeking	0	4	3	7
Emotionally Reactive	2	7	4	13
Low Endurance/Tone	3	3	3	9
Oral Sensory Sensitivity	0	4	1	5
Inattention/Distractibility	4	7	4	15
Poor Registration	3	4	3	10
Sensory Sensitivity	1	2	0	3
Sedentary	6	4	1	11
Fine Motor/Perceptual	2	2	2	6

With regard to the Sensory Profile factors, more than half of the sample had a definite difference in relation to the Emotionally Reactive, Inattention/ Distractibility, Poor Registration, and Sedentary factors. All of the students with

Asperger's Disorder had a definite difference in relation to the Emotionally Reactive and Inattention/Distractibility factors and more than half had a definite difference in relation to four other factors. All of the students with ASD-NOS had a definite difference in relation to the Emotionally Reactive and Inattention/ Distractibility factors and more than half had a definite difference in relation to three other factors. More than half of the students with Autistic Disorder had a definite difference in relation to two factors.

Definite difference in relation to the Low Endurance/Tone and/or Poor Registration factors is evidence that an individual is hypo-responsive, that is, does not notice sensory stimuli that others notice, whereas definite difference in relation to the Emotionally Reactive and/or Sensory Sensitivity factors is evidence that an individual is hyper-responsive, that is, notices sensory stimuli more readily than others. In these terms nine students in the sample had both hypo-responsiveness and hyper-responsiveness. These were three (75%) of the four students with ASD-NOS, four (57%) of the seven students with Asperger's Disorder, and two (29%) of the seven students with Autistic Disorder.

Theory of Mind Functioning

The theory of mind ability of students in the sample was assessed using the Sally and Anne test, the test involving the "Banana" story, the test involving the "Picnic" story, and, for the students in the sample who were old enough, the test involving the "Fido" story. Assessments of the nine students in Group One and the nine students in Group Two were conducted by the writer before the implementation of the research model in relation to their respective groups. The numbers of students who made a correct choice or gave a correct justification, the numbers of students who made an incorrect choice or gave a literal or unusual justification, and the numbers of students who did not answer or said they did not know are set out in Table 6.23. The numbers of students in the whole sample and in each autistic diagnostic category are given.

Table 6.23

Numbers of Students in Each Autistic Diagnostic Category and in Whole Sample
with Correct, Incorrect, or No Answer to Theory of Mind Test Questions

Theory of mind test	Answer to test question	Students with AD	Students with AS	Students with ASD-NOS	Total sample
		$n = 7$	$n = 7$	$n = 4$	$n = 18$
Sally and Anne test	Correct choice or correct justification	0	7	3	10
	Incorrect choice or literal or unusual justification	7	0	1	8
	No answer or did not know	0	0	0	0
"Banana" story	Correct choice or correct justification	0	3	0	3
	Incorrect choice or literal or unusual justification	4	3	4	11
	No answer or did not know	3	1	0	4
"Picnic" story	Correct choice or correct justification	0	2	1	3
	Incorrect choice or literal or unusual justification	3	3	3	9
	No answer or did not know	4	2	0	6
		$n = 2$	$n = 3$	$n = 1$	$n = 6$
"Fido" story	Correct choice or correct justification	0	1	0	1
	Incorrect choice or literal or unusual justification	1	2	1	4
	No answer or did not know	1	0	0	1

All of the seven students with Autistic Disorder did not give the correct answer in the Sally and Anne test regardless of their age and one of these students was nearly twelve years of age. Although only one of the four students with ASD-NOS did not give the correct answer in the Sally and Anne test, all of them did not give the correct answer in any of the more advanced tests, with only one exception. Although all of the students with Asperger's Disorder gave the correct answer in the Sally and Anne test, up to five of them did not give the correct answer in the more advanced tests.

The "Banana" story ends with Emma saying, "Look! This banana is a telephone!" Sixteen students gave the correct answer to the comprehension question, "Is it true what Emma says?" but only three of these students then gave the correct answer to the question requiring a mental inference, "Why does Emma say this?" These three students were all students with Asperger's Disorder. Eleven students gave incorrect answers involving physical or literal justifications. These incorrect physical or literal answers included, "Because she thinks it is a phone," and, "Because she might be young and doesn't know." The other four students indicated that they did not know why.

The "Picnic" story ends with Sarah saying, "Oh yes, a lovely day for a picnic alright!" Eight students gave the correct answer to the comprehension question, "Is it true, what Sarah says?" but only three of these students then gave the correct answer to the question requiring a mental inference, "Why does she say this?" These three students were two students with Asperger's Disorder and one student with ASD-NOS. Nine students gave incorrect justification answers. One answer was, "Because [Tom] said it was going to be a lovely day," which referred to the information in the story that Tom had said it was going to be a lovely day for a picnic. Another answer was, "Because she is trying to pack up the picnic," which referred to the information in the story that it had started to rain just as they were unpacking the food. Another answer was, "She's cuckoo and doesn't know it is raining." The other six students indicated that they did not know why.

Of the six students from the sample who were old enough to be assessed using the test involving the "Fido" story, all of the students could answer the

concrete questions about what happened in the story apart from one student with Autistic Disorder. In response to the final question, "Why does Emma's mother say that Fido is the cause of Emma's asthma attacks?" all of the students (apart from one student with Autistic Disorder who gave no answer) attempted to give reasons for the mother's statement. Only one student was able to answer correctly in terms of the mother's intent which was to get rid of the dog. This student was a student with Asperger's Disorder. The other students gave incorrect justifications. These incorrect justifications included, "It could be the fur on her," "Because the mother got bitten by a dog," and, "She can probably still smell the dog and the attacks".

CHAPTER 7

THE IMPLEMENTATION OF THE RESEARCH MODEL

In this chapter some details about the participation of teachers, parents, and other professionals in the research model are given. This is followed by descriptions of some of the interventions that were implemented for the eighteen participating students. These interventions are described and explained in more detail in order to show the type and range of these interventions. These descriptions and explanations are grouped according to which structural or curricular element of the research model was being worked on in the intervention.

Teachers, Parents, and Other Professionals

With regard to the involvement of teachers and parents in the project, all participating teachers and parents were regular in attendance. Specific additional time release for teachers was only facilitated in two of the nine schools in the project. This involved time release for the teachers of three students (two teachers in one school). All the other teachers had to use their own time release, other break times, or time after school to participate. (This differed from what was requested in initial discussions with school principals in setting up the research project.)

Several participating teachers became interested in doing further reading about autism or in seeking additional resources and knowledge. Sometimes this was facilitated by the autism consultant and sometimes the teachers sought further information for themselves and shared what they were finding in the group meetings. Teachers also reported to the autism consultant that learning was occurring incidentally in a variety of other ways. Teacher's reported that there was more discussion about autism occurring between staff in the lunchroom and in staff meetings. They also reported that there were follow-up discussions occurring between staff in relation to the interventions being implemented that affected the whole staff.

Two parents (one a parent of a Group One student and the other a parent of a Group Two student) began timidly and felt reluctant to take up too much of

the teacher's time, but by the end of the project both of these parents were more comfortable in a school environment and enjoyed knowing more about how their child was going.

With regard to the involvement of other professionals in the project, particular support was sought from a school support psychologist for three students, from two school support speech pathologists for four students, from an Education Department special education consultant for one student, and from an occupational therapist employed by the local hospital for three students. In the case of a student who had particular motor needs that were not being met, further occupational therapy support was sought and some input from the occupational therapist was sought at a meeting of the planning and support group.

Consultative help was sought from local special school staff in relation to one student. Support from special school staff at a regional special school was also sought for another student. A day visit to the regional special school was arranged by the autism consultant for the teacher and two teacher aides involved with this student. Input from a technical expert regarding voice-activated computer programs and other advanced technical support options was set up for the teacher and teacher aide involved with one student.

With regard to the whole school training session, it was found that it was helpful if this session occurred a little while after the beginning of the planning and support group meetings. By this time the teacher (and teacher aide if allocated) who were members of the planning and support group had sufficient time to settle into the project. As well, more of the assessment and information about the student/s at the school who were participating in the research project had been undertaken and so was available to the facilitators of the whole school training session. In one school it was requested by the teachers that a second session be conducted because they wanted more time to be able to talk about behavioural interventions.

Talking about Disabilities

With regard to teachers and parents talking about disability and/or ASDs with the student with an ASD and the student's peers, it was found that both

teachers and parents had different levels of comfort in doing this. In relation to whether teachers should talk to a student's peers about the student's particular disability, teachers were aware that they should not do this unless specifically permitted to do so by the parent. Three teachers initiated discussion in the planning and support group meetings by saying that they thought it was important for the peers of the student to have some understanding of the student's difficulties. However, after discussion with the parents it was decided to do this in a generic way by talking to the class about difference and disability rather than ASDs in particular. Each of the three teachers was very happy to do this themselves and the autism consultant provided some resources to help them.

It was found that many of the participating parents had not, in fact, talked with their own child about his or her disability or about him or her having an ASD. After discussion about this in the planning and support groups, four parents decided that they wanted to talk with their child about their disability. A range of possible resources (Brosen, 2006; Crissey, 2005a; Faherty, 2000; Vermeulen, 2000; Welton, 2004) to help the parents talk with their child was provided by the autism consultant. Only one parent in the project specifically wanted her child's peers to understand about her child's specific disability. This parent strongly believed in the importance of accurate knowledge and also requested that the parents of her child's peers were given an explanation of her child's disability.

Whole Class Interventions

The implemented model was based on a belief that students with an ASD would need support which related to their unique mix of needs. However, during the process of recognising student need and working together to decide on interventions, it was found that teachers were interested in introducing programs and producing materials that could have immediate usefulness to the whole class or to a number of students in their class. Teachers preferred to implement support for the student within the general class and to adapt curriculum derived from the general curriculum wherever possible. What occurred, then, was that teachers decided that many of the interventions which were supportive for the student with an ASD could be implemented for the whole class.

Although some structural elements were implemented through one-to-one involvement with the specific student with ASD, many of the interventions ended up being whole class adaptations, or adaptations that could be utilised for a number of students in the class. Although students with an ASD might sometimes be engaged in alternative curriculum to the general curriculum framework, most of the time they were involved in undertaking the general curriculum, with their tasks adapted to support them structurally and adjusted in terms of outcome. The general curriculum was used as the entry point for the student and the work was modified in various ways. In general, when literacy related tasks were modified, the students still worked on these tasks in times when the whole class was involved in literacy and they were working at a level appropriate for them with perhaps some other students in the grade as well. It was found that many interventions were highly successful when implemented on a class-wide basis. In addition, other students in the class were found to benefit from the structural supports and adaptations for the student with an ASD.

Providing and Producing Resources

With regard to the implementation of interventions, the autism consultant helped by providing resources and by making teachers aware of the resources available. These could be structural resources (e.g., a move and sit cushion to help provide a student with additional sensory input while sitting) or curriculum resources (e.g., resources to help with whole class understanding about ASDs, resources to teach students with an ASD about social skills, resources to teach about hygiene, or resources to teach about relaxation). Some interventions involved actually producing resources, trialling them during the course of the project, and modifying them further if necessary. Other interventions involved modifying the existing curriculum.

Parent-teacher collaboration was evident in the implementation of interventions in practical ways. For example, parents were very keen to help in the making of the visual supports that were produced for the student. Sometimes these were made together during regular session times and at other times parents were willing to give additional time to support the teacher in the production of these

resources. Some parents even offered to contribute financially to the items needed for the production of these tools, such as Velcro or laminating sheets. This was only necessary in some schools that did not provide such items.

Many parents requested that they would like to produce items for use at home similar to those that were being produced for the student at school. For example, parents could see the benefit of a visual schedule for help in home organisation (e.g., morning and afternoon routines, items to remember to take to school, details about outings or holidays). The production of these items for home use was facilitated by the autism consultant but often occurred with the parents' help at an arranged time.

Cognitive-Organisational Structural Supports

At the start of the project nine of the eighteen participating teachers already had in place a daily schedule for their whole class. This was presented in words. Most of the teachers placed this on the blackboard or on a board near the front of the class. One teacher provided every student with a laminated daily schedule that was placed on his or her desk. One teacher had found that referring to the daily schedule was the only way that she could get her student to leave the classroom to go to another class (e.g. art).

The other nine participating teachers who did not have daily schedules in place wanted to be supported in establishing them. In the lower primary school grades the schedules that were produced consisted of pictures as well as words. They were made relevant to the whole class, and were also flexible and could be easily changed if the timetable changed. They were found to be a source of great interest to the whole class and it was reported by teachers that many students enjoyed referring to them and making sure that the daily schedule was correct for a particular day. However, no school in the research project had access to computer software to help with making visual schedules before the autism consultant facilitated this for the teachers.

A variety of other cognitive-organisational supports were facilitated. For six students, individual task boards were produced. These were mostly made for

younger students. For the older students, simpler formats were often put in place (such as a checklist sheet with boxes to tick when a task was completed).

Other visual supports were implemented for the whole class or for individuals, such as choice boards for various activities, visual depictions of what working well meant, desk organisation, routines required at the end of the day, and visual reminders of specific tasks (such as it being toilet time).

Other sorts of supports that were implemented included providing grid paper for setting out numerical operations, producing work sheets that had been broken down to contain smaller amounts of information and shorter tasks, and setting up more manageable work folders for older students.

Specific systems for home-school communication were set up for eight students to facilitate communication between home and school. These included visual methods of communicating positive things about the student's day that were prepared by the student and simple notebooks for communication from either the teacher or parent. One older student was taught to use a regular commercial diary which was used to set up a system in which a large paperclip would be clipped onto the diary by either the teacher or parent to indicate that there was an important message in the diary that needed to be read by the parent or teacher. Teachers and parents who did not have a physical system in place preferred simply to talk together briefly in the morning or after school if there was something to communicate.

Social-Communication Structural Supports

For all participating students, the autism consultant discussed with the teachers and teacher aides the language they used in the classroom when explaining or giving instructions and the need to be explicit in their use of language. For eleven students who had receptive and/or expressive language difficulties, ways of approaching these difficulties were discussed further. For two students, further support was sought from a speech pathologist in relation to these students' language processing difficulties.

For thirteen students who had particular difficulty with auditory memory ability, the autism consultant discussed with teachers and parents what

accommodations could be made. A range of possible strategies to support auditory memory was discussed. This included keeping verbal instructions to a length that the students could reasonably remember. Several teachers put visual strategies in place to supplement the student's understanding of instructions.

One student was supported in his social skill development by becoming a regular helper in the Preparatory Grade. He related well to younger students and it was felt that he benefited socially from involvement with younger children. It was also supportive of his self-esteem for him to feel helpful.

Some of the social-communication structural supports related to outside play. Some of these supports were individually based. For eight students, a better system of communication between the classroom teacher and lunchtime yard duty teachers was put in place through consultation with the school principal or through staff discussion at a staff meeting. This was done so that the classroom teacher could be informed immediately of playground incidents relating to the student so that she or he could be involved in any necessary further action and so that she or he could put in place preventive measures in the classroom if it was likely that the student with an ASD might still be distressed about the incident and easily overloaded in class.

For four students who had problems in the playground in relation to bullying, the student was taught an anti-bullying program developed by Gray (2004) that was specifically devised for students with an ASD. The program was taught by different people – in one case, the student's teacher, in another case, the student's teacher aide, in another case, the school welfare worker, and in another case, the Assistant Principal. The program involved putting in place a *team* of supportive adults so that as well as being taught what to think, say, and do when approached negatively by another student, the student was also taught to always find one of the supportive adults on his or her team if there was an incident. The student's learning was supported with visual reminder cards of what to "think", "say" and "do", and also included pictures of the supportive adults on his or her team. Each of the supportive adults on the team were helped by the autism consultant to understand more about ASDs, and were also taught how to best respond to the student and how to make the most of the opportunity of

engagement with the student to teach in a natural way positive social and communicative skills.

Two students were provided with daily play objects (e.g., skipping rope, hoop, "bionical") by their parents. One student was provided with daily play objects by his classroom teacher. One student was provided with visual reminders of his daily lunchtime activities that he was to take part in (i.e. Monday – lunchtime art, Tuesday – sand play, Wednesday – special toy from home, Thursday – library games, Friday – computer club). One parent made special arrangements with her child's teacher to provide particular activities for her child on wet weather days. For one student who was having difficulty knowing what to do in the playground, it was set up that a Grade 6 "buddy" would play games with him during one lunchtime a week. The "buddy" was specifically trained and supported by his classroom teacher in how to undertake this responsibility.

For one student who was moderately intellectually impaired and who had recently experienced serious bullying, an increase in teacher aide support during lunchtime was set up. The teacher aide involved the student in a range of individual or small group activities during lunchtime.

One student had ongoing social difficulty due to holding grudges. He held on to incidents involving a negative social interaction with another student and could then react aggressively toward the other student some time after the incident. To support this student, his teacher met briefly with him every day after lunchtime. His teacher checked how lunchtime had been for him and discussed with him any playground issue that had occurred. If any issue was discussed, his teacher made sure that he knew that the issue would be dealt with by her. Then, a short time later, she met with the student again to discuss what had occurred in relation to the resolution of the issue. She then asked the student, "Do you think this issue has now been dealt with?" If the student felt it had been, he was supported in writing down on a piece of paper how the issue had been resolved. This piece of paper was then put in a "resolution box" to symbolise concretely for the student that the issue had been resolved. His teacher also made sure that he knew that if another issue arose he was to find her (or another designated "back-up" person) straight away, rather than try and deal with it himself.

While some social-communication structural supports which were related to play were individually based, other supports were more broadly based. Several teachers trialled teaching the whole class a group game that could be the play focus for a particular week and played during recess and lunchtime. Through teaching the game the teacher was able to provide not only ideas about good games to play but was also able to clarify the rules of the game for all of the students. Some teachers introduced play objects for recess and lunchtime that were available to be used by all students, however, the teachers also made sure that every recess and lunchtime the student with an ASD had objects that could be played with. One teacher began a "friendship tree". This was a designated tree in the school yard where any student who wanted to find a friend could go. Specific adult supervision was provided at the tree and all of the school staff were involved in planning how this would be done.

One student in the research project had a problem with throwing stones in the playground. It was decided in the planning and support group meeting that the classroom teacher would raise this problem at a staff meeting. The staff decided that a school working bee which involved the whole school would be put in place to remove stones and rocks from the playground to make sure that all dangerous objects were removed from the playground. It was explained to all of the students that stone-throwing was dangerous and that it was important that the playground be made safe. This strategy proved to be helpful for a number of other students who were also throwing stones during recess and lunchtime.

Behavioural-Emotional Structural Supports

A variety of behavioural-emotional structural supports were implemented. For seven students, a specific behavioural management plan was established which planned for both stress management and crisis management whatever the student's level of behavioural difficulty. The behavioural management plan that was devised was based on interventions to reduce the student's stress levels. In this way the behaviour management plan was primarily a preventative behavioural management plan, even though the plan also included what to do if the situation escalated to a crisis.

With regard to stress management, the plan was based on program ideas in the book *Navigating the Social World* (McAfee, 2002). The student's teacher and parent monitored for a period of time how the student demonstrated stress through his or her behaviours (e.g., physical body movements, repetitive behaviours, verbal utterances or noises). It was then worked out which of these signs of stress demonstrated low, medium, or high levels of stress. For each of these levels specific intervention ideas about what helped the student were then discussed and trialled. The implementation of the specific interventions to reduce stress was directed by the teacher, but the teacher also taught the student what his or her signs of stress were and what helped him or her when feeling stressed. A process was also put in place for when the classroom teacher was absent. This process was that the relief teacher would be given something brief to read about the stress management plan that was in place for a particular student. This explained the signs of stress that the student demonstrated and the particular strategies which were in place for responding to the student's low, medium, and high levels of stress.

With regard to crisis management, a specific plan was put into place in relation to managing a situation when the student's stress response escalated to a crisis level. This plan was communicated with all teachers at the student's school and a particular group of teachers was designated to be responsible for implementing the plan. This group of teachers was trained to understand the way in which the student should be approached when stress was evident and they were clearly briefed about all procedures that had been decided. When the classroom teacher was absent, the relief teacher was also briefed about the crisis management plan.

Structuring a behaviour management plan in terms of helping teachers know what particular signs of stress a student demonstrated and what interventions were supportive for a student at different levels of stress was found to be helpful. The teachers who trialled this approach to behaviour management in the research project responded well to its use.

Other behavioural-emotional structural supports were also implemented. It was mentioned in the preceding section that a *team* of supportive adults was set up

as a social support network for four students. This team of adults was also set up as an emotional support for the student. The student could find one of the adults on his or her team if he or she needed a safe place and person to be with for a while.

For two students, a mentor relationship was established. In both cases the assistant principal volunteered to have this role. The students spent regular time with the assistant principal engaging in activities and being encouraged about good progress.

For two students, a private message communication system between the student and the teacher was established. One student had difficulty in asking his teacher if he and his teacher might talk together at some time. The other student had difficulty expressing to his teacher how he was feeling at certain times. Both students were older students and they very much did not want to be noticed by their peers as having a difficulty. It was arranged that they could communicate with the teacher by leaving a picture on the teacher's desk. The first student used a picture of a parrot to convey that he would like to talk some time. The second student chose pictures of animals that would convey how he was feeling (e.g., a crocodile for feeling angry). The student had these animal pictures in a little pouch that he kept in his desk.

For two students, a behaviour reward system was set up. One of these students had been school refusing. In addition to a range of supports set up by his teacher, his mother set up a points system with him by which he could earn time with her, doing something special. The other student was using rude words occasionally. In addition to his teacher educating him concerning appropriate word use, his mother set up a reward system at home. He was able to work towards extra computer time at home on a special game if he made good progress.

For one student, a "take a walk" pass was implemented. This student had a problem with leg muscle spasms. When this occurred he was better to just go for a walk than become more agitated. Implementation involved him giving the pass to his teacher whenever he needed to go for a walk. This process was found to reduce considerably his anxiety and fear of visibly behaving strangely when he experienced spasms.

Sensory and Motor Needs Structural Supports

For all participating students, teachers provided "down time" as part of the student's regular daily schedule and provided additional "down time" for the student if they thought the student was demonstrating signs of escalating stress. *Down time* was provided in a variety of ways. Thirteen of the teachers chose to program down time for the student on an individual basis, three teachers chose to do so on a whole class basis, and two teachers chose to do so in both ways. With regard to the teachers who provided down time for the whole class, four teachers introduced a daily whole class relaxation session after lunch for the whole class. Specific relaxation exercises were taught to the whole class. The exercises that were used were part of a relaxation program in the book, *Relaxation for Children* (Rickard, 1994). These teachers reported that this was very satisfactory (with the side benefit of providing relaxation time for the teacher as well). In one school the benefits of this intervention spread (via staffroom conversations) to many other staff members who also wanted to implement this as a regular part of their day in their classes. One teacher introduced down time for the whole class by implementing a daily quiet reading time after lunch for the whole class. For one student, it was part of her daily schedule that she went to a daily relaxation class for a small group of children conducted by a teacher aide.

A number of other interventions to support students' sensory needs were made by teachers. Some of these were made on an individual basis. For one student who was sensitive to light and background noise, his classroom desk was re-positioned. For another student who had marked difficulty with background noise, the teacher introduced some periods during the day when he could work with ear muffs on. For another student who had marked difficulty with background noise and found learning more difficult in a noisy environment, some one-to-one support outside of the classroom was put in place. For one student who had difficulty with writing tasks because she was sensitive to the noise that a pencil made on paper, it was put in place that she could write on an individual whiteboard with a soft tipped pen for all writing tasks. For one student who had difficulty working in close proximity to other students and found it very difficult to work at a double desk next to another student, it was implemented that he could

sit at a double desk by himself in all subject areas. For one student who had difficulty registering when she needed to go to the toilet, regular toilet breaks were introduced as part of her daily schedule.

Some of the interventions to support students' sensory needs were made on a whole class basis. Two teachers created quiet play and recreation areas in which any student could, for example, read quietly or do puzzles. However, each of these areas was particularly designed with the student with an ASD in mind, so there were objects in the area which this student was known to enjoy and to be calmed by (e.g. soft fabrics, Lego blocks, and books with a lot of visual detail). One teacher introduced a quiet working area that all students could access at times but that the student with an ASD could use whenever the teacher thought it would be helpful. This area was designed as a desirable space by setting it up like an office with *in* and *out* file baskets and other office equipment. For one student who had difficulty with noise, the teacher rostered students to monitor the classroom noise level using a noise "thermometer" which showed whether the class was *too noisy*, whether there was *OK working noise*, or whether the class was *very quiet*. For one student who had a need to receive oral stimulation through chewing, the teacher introduced a mid-morning drink and crunchy snack break for the whole class. Crunchy snacks were stipulated for health reasons but also because of the special need of the student with an ASD. For another student who had a need for additional oral stimulation, the teacher introduced having a drink bottle available all the time on each student's desk and allowed students to have a "drink break" whenever they needed. This facilitated the hydration of all students, while simultaneously providing an age appropriate chewing possibility for the student with an ASD.

Particular sensory accommodations were also put in place for some students outside the classroom. For one student who had particular difficulty in crowds, a range of supports was put in place on inter-school sports days. For another student who had particular difficulty in crowds, a range of supports was put in place for excursions to public performances. In addition to preparing him for what was to happen, it was arranged for him to sit up the front of the bus, to be next to a familiar adult at all times, and to be able to listen to familiar music on a

personal CD player or IPOD whenever desired. For one student who had difficulty on any bus trips due to difficulty with noise and who travelled each day on the school bus to and from school, accommodations were made in terms of his seating position on the bus and his use of a personal CD.

Many of the students in the research project had subtle fine motor difficulties and tired easily in handwriting tasks. For these students, the use of a computer for writing tasks was increased. One student in Grade 4 (fifth year of schooling) had illegible handwriting and had been evaluated by an Occupational Therapist as having marked fine motor difficulties. It was decided that this student could do all writing tasks on a laptop computer. One student in Grade 1 (second year of schooling) also had marked difficulty with handwriting. It was decided that he could do all handwriting tasks on coloured thirds writing paper.

Supports in Traditional Academics

A variety of supports were provided for seven students in the research project who were indicated to have a Specific Learning Disability in relation to reading. Two students were linked in during the course of the project to the school's Reading Recovery program (Clay, 2005). One student was included in the school's Teaching Handwriting Reading and Spelling Skills (THRASS) program (Davies & Ritchie, 1998). Two students joined in additional literacy classes provided by the school that were not based on any specific programs. Other students were given time in class to work sequentially on recommended computer literacy programs such as Word Shark 3 (WhiteSpace, 2005) and Phonics Alive (AdvancedSoftware, 2002).

For one student in Preparatory Grade who was not yet able to recognise individual sounds orally and one student in Grade 1 who could not match letters visually, the autism consultant provided recorded oral literacy teaching resources and computer literacy programs to help with auditory discrimination. Other teaching resources were also produced for these students which involved matching shapes or movable letters. For one student in Grade 5 who could not name the letters of the alphabet, power point presentations that taught basic literacy skills were prepared with the student's help. Concern was so great for this

student in relation to literacy skill development that the teacher, the teacher aide, the student, and the student's parents went to Melbourne to trial software that could recognise speech and read aloud highlighted text so that an appropriate computer program could be purchased by the school to support the student.

A variety of accommodations were put into place for thirteen students who were indicated to have a Specific Learning Disability in relation to Written Expression. For one student who could not yet write a sentence, very simple sentence forms were prepared and the student had to choose a picture to complete the sentence. As this skill developed the student could then move on to writing some of the sentence, and then all of a simple sentence.

For several students, the resource *Story Stuff* (Rees & Clark, 1998) was used to produce *story plans* which gave the student a framework to follow. For students whose written expression ability was just beginning, their story writing ability was supported by using laminated sheets of picture prompts about *when*, *who*, *where*, and *what happened*. Students were only required to circle the pictures which represented the choices for their story. Students with more ability could make their choices but with a support person could then write out the story they had created. More complex story plans prompted choices about *when*, *who*, and *where* at the beginning of the story and then prompted choices about *what happened* and *feelings* for the middle and end of the story. Both the level of visual prompting and the amount of writing that the student was expected to do was adjusted according to the student's ability.

For some students in the project, the teacher learned to support the student's writing through teaching the student how to use *mapping* skills (Moline, 1995; Ward, 1998). This technique gave the student a way of presenting information with only a small amount of writing. In some cases the teacher taught this technique to the whole class but found the technique to be particularly helpful for the student with an ASD and other students with a Specific Learning Disability.

A variety of supports were provided for nine students who were indicated to have very low reading comprehension ability. In general, teachers found that ideas in the *First Steps: Reading Resources Book* (Education Department of

Western Australia, 1994) were very helpful. For one student who was hyperlexic and had excellent reading ability but very poor reading comprehension, texts were produced that specifically related to everyday events and activities in which the student participated. This was done so that text could have meaning for the student. Texts were also produced that required the student to read the text and then perform an activity (e.g., following directions about making a simple pre-cut-out rabbit).

For two students who a Specific Learning Difficulty in relation to numeracy and for some other students who were functioning below grade level, numeracy resources at a range of levels were readily available for the teacher. For one student who became easily overwhelmed when completing numeracy tasks, the teacher reduced considerably what was presented to the student to be completed.

For some students in the research project, the teacher made a considerable effort to think of ways that the student's strengths could be emphasised in certain aspects of the curriculum. This tended to be the case if the student was in a middle or upper primary grade. For one student who was very good at using the Power Point computer program, the teacher introduced more tasks in which the student could use his Power Point presentation skills. The use of Power Point was also found helpful in that minimal amounts of writing needed to be used on each slide. For one student who was interested in ancient civilisations, the teacher introduced more on this topic. For a number of students who were particularly interested in certain objects (e.g., Tangrams and brainteaser puzzles), the teacher brought more of these objects into the class to be used as relaxation down times after completing other work. For one student who had excellent general knowledge, the teacher introduced a weekly quiz in which students could elect to participate. This was an activity that greatly enhanced the self esteem of the student with an ASD.

Adaptive Behaviour Curricular Supports

A range of interventions was made to support the students in the research project who had difficulties in terms of adaptive behaviour skills. Some support in relation to adaptive behaviour skills was necessary for every student in the

research project, but more marked focus on adaptive behaviour was necessary for ten students. Five students who ranged in age and who were in Grade 1 to Grade 4 (two to five years of schooling) needed support in getting to bed on time on school days and getting to school on time. For four of these students, morning and evening schedules were prepared. However, one student who was in Grade 3 (fourth year of schooling) and who was school refusing at the start of the project reacted negatively to a visual schedule. For this student, a range of other strategies was used, including, in the morning, a routine that was implemented verbally by his mother and, in the evening, relaxation practices.

Other adaptive behaviour supports that were implemented included helping two students who did not know how to pack up at the end of the school day through visual supports.

Another support was also put in place for a student for whom there was evidence that he was unaware of "stranger danger". The teacher implemented whole class teaching in relation to stranger danger and a social story (Gray, 1998; Smith, 2003) about this danger was prepared for the student. In addition, a clear process was put in place for the student if his mother was not exactly on time to pick him up after school and a visual reminder of this process was made for him that he could carry with him at all times.

For several students, preparation for excursions and camps was a very important opportunity for teaching adaptive behaviour skills. Three students needed specific teaching to occur in relation to school excursions to enable them to participate fully. One student was prepared for shopping outings through the use of a social story and specific role play. Another student had difficulty knowing when it was appropriate to ask questions when being led by a guide on excursions, and specific teaching, as well as the use of a social story, was necessary to prepare the student for an outing. Another student needed to be prepared about what to expect on an outing to the zoo, so a small laminated visual booklet was made for this student as well as for all the students in his class. This booklet was enjoyed by all the students and a few parents of the other students also commented about how helpful it was for their child.

For three students in the research project, specific preparations had to be made for them to manage school camps. For one student who was easily overwhelmed by noise and also had difficulty in relation to public toilets, all of the teachers going on the camp were briefed that the student might have these difficulties and a range of ways to manage these difficulties was discussed and prepared for. For one student who was not continent at night and who was very sensitive about this, arrangements to minimize his embarrassment were put in place with all of the staff who were going on camp.

Another boy in the research project who was in Grade 5 (sixth year of schooling) had not been on any previous school camps. Teaching was put in place in a number of areas to prepare him and to increase his adaptive skills so that he could manage camp. Firstly, he was supported to become more familiar with the places that would be visited through a pictorial daily camp program using real pictures. Secondly, he had a very restricted diet due to sensory sensitivities, so he was helped to adjust to the sort of breakfast cereals that would be available on camp through practice eating these cereals at school in sessions with his teacher aide. Thirdly, he had not yet developed the ability to ask a shop keeper for a food item so that he could buy his lunch. This was one of the activities that all of the students would be required to do on the camp, so a graded range of experiences to increase his skill in this area was devised. He needed to improve his ability in identifying money denominations and using money, so these skills were taught. He was also taught how to store his money safely in a wallet. Fourthly, he did not have the ability to state his name or contact details, so this was practiced. In addition, a system for having him carry his identity and contact numbers was arranged. Fifthly, he was reluctant to shower regularly, so he was taught the importance of showering regularly and further understanding of hygiene occurred through the use of a resource titled *Personal Hygiene? What's that got to do with me?* (Crissey, 2005b). Sixthly, when he did shower, he had a tendency to shower in very hot water, so a system was devised to help him test the temperature of water to be used for showering at camp and he began to practice this skill at home. As well as the student himself being prepared for going on camp, all of the teachers going on camp with him were briefed about his particular difficulties and

what he had been learning recently, and two camp "buddies" were specifically trained in relation to supporting him on camp. The camp was a very successful experience for the student, so the lengthy preparation proved to be worthwhile.

Vocational Skills

There was not a lot of focus in the planning and support groups on vocational skill development. Probably the most direct way in which students were helped with long term vocational skills was through being given more responsibility. For three students, the teacher specifically introduced ways in which the student could demonstrate responsibility. One student became the class computer monitor, another student was responsible for updating the daily schedule for the day, and another student was responsible for taking messages to the office. Another way in which one student was helped with long term vocational skills was through being helped to work regularly on a computer typing program. Apart from this, vocational skills were only encouraged in incidental ways. For example, the use of daily schedules and individual task boards (or task sheets) helped students to become more organised and this encouraged positive work habits.

Metacognition

Meta-cognitive skills were taught incidentally within a number of interventions. For example, visual schedules helped to build student flexibility and other visual materials helped student's learn about making choices. The support *team* of adults that was put in place for some students, and the teaching that accompanied the introduction of this support team, also specifically encouraged the students with an ASD to seek help. As well, the stress behaviour management plans that were put in place for some students were aimed at eventually helping students to recognise and learn what action they could take to reduce increasing signs of stress themselves.

Social Communication Curricular Supports

It was found that the individual education plans that were already in place for students with an ASD focussed more on the development of academic skills than the development of targeted social skills. Teachers in the research project, though, recognised the importance of including curriculum in relation to social communication skill development.

For all of the students in the research project, a range of initiatives was implemented to support and teach social communication skills. Teachers taught about emotions, friendship skills, and conversation skills, and enhanced social problem solving abilities. This was often whole class teaching because teachers felt that many of their students could benefit from learning social skills. Teachers also felt that if a particular social skill that was helpful to the student with an ASD was taught to the whole class then all of the students could reinforce each other in the development of this skill. Teachers also often considered that it was a better use of resources and time to utilise a program or a created resource for the whole class rather than for a single student. For example, three teachers requested a list of sequential social skills that could form the basis of a particular class focus each week. The teachers wanted to utilize discussion and role play and have all of the students in the class focus on practising that skill during the week. A list of specific social skills that could be built upon in a sequential order was provided by the autism consultant for three teachers. The list of skills was based on *The Walker Social Skills Curriculum* (Walker et al., 1988).

Even when students in the research project had specific social communication difficulties, social skill teaching related to these difficulties was often incorporated into whole class teaching. Four students in the research project had specific difficulty with losing when playing a game. Another student had particular difficulty with managing angry feelings. In each case a social story was written for the student. However, because the teacher wanted to use a social story as a teaching tool for the whole class, the story was written with the general class in mind. Hence, many students were referred to in the text, including the student with an ASD. All of the teachers reported that using the story as a text with the whole class worked well, whether the story related to losing games or managing

angry feelings. However, given that the story was used for the whole class rather than the individual student the story should really be called a *social script* rather than a social story. The specific rules of writing a social story were taught to teachers by the autism consultant in the planning and support group so that this method could also be used in its pure form when desired.

Three teachers introduced a strategy of reading an age appropriate story to the whole class (as was frequently done in a normal day) and then having a discussion about feelings. The autism consultant provided pictures (either outlined cartoon-like faces, photographs of faces, or pictures of body poses) which could be used by the teacher to facilitate the discussion. The pictures could be used in a variety of ways. For example, if a certain character in a text experienced surprise, then the students might be asked to identify the face that had a surprised expression. The teacher of a class of older students used a set of pictures with body poses (and no facial expression) that demonstrated certain emotions, and these were used in general class discussion about texts.

An interactive story that was created to teach students about emotions was used by several teachers with small groups of students who could also benefit from additional learning in this area (sometimes with the support of a teacher's aide). For two very young students in the research project, interactive feelings books were made to support the understanding of emotions. The books included a range of feelings pictures that could be shifted using Velcro. To complete a sentence the students made a choice of what feeling picture was true for them. For example, "I feel happy when I do a good job". In both cases teachers reported that the resource was used and enjoyed more widely than by just the student with an ASD. This was viewed positively and increased the target student's enjoyment of the learning tool.

Three teachers implemented more explicit teaching about taking turns in whole class discussions. In addition to discussing taking turns, students practised this skill. The first of these three teachers used a talking stick that one student handed to another student when it was the other student's turn to talk. The second teacher used a microphone in the same way. The third teacher used *my turn to talk* cards and gave every student a set number of cards. This was done to encourage

all the students in the class to contribute to class discussions but also to limit the talking of the student with an ASD who tended to interrupt other students and not know when it was another student's turn to talk. One teacher implemented regular teaching for the whole class about listening skills but had the student with an ASD in mind. In order to learn more about listening the students in the classroom were arranged in pairs and took turns to talk and listen in timed intervals about a set topic.

Other whole class activities to promote social skills that were implemented included setting up a "shop" in the classroom where students had to learn to ask for items in a polite and appropriate manner, setting up a play corner where telephone conversation skills were practised, and using a "karaoke machine" to sing greeting songs.

Two teachers implemented regular sessions with their whole class during which social problems at school and in the yard could be discussed. In order to support discussion in class, and to help make what occurred visual as well, both of these teachers learned how to use cartooning, as in *Comic Strip Conversations* (Gray, 1994a), as part of the activity. Cartooning was used to explore what had happened as well as to depict visually what could be done next time that would be more helpful. In addition to cartooning, both of these teachers also incorporated role playing to demonstrate positive behavioural responses.

Support and teaching about social communication skills also occurred on an individual basis for some students in the research project. One teacher learned to use cartooning as a tool that could be used individually with a student with an ASD after an incident had occurred in the playground.

For four students who were in Grade 3 (fourth year of schooling) or higher, the use of the computer program "Mind Reading" (Baron-Cohen, 2004) was trialled. This interactive computer program is designed to help students recognise emotions in others. Two of the students used this program during school time and two students used this program at home. It was reported by the teachers and parents that each of the students enjoyed this program.

Another student in the research project required very specific teaching relating to what was appropriate and inappropriate in terms of touching others.

This was necessary due to possible sexual connotations regarding some touching that had occurred between the student and a peer. Specific counselling and educative support with the school counsellor was put in place for this student.

Self Management Curricular Support

Self management was incorporated in many of the interventions that have already been discussed. For example, in one of the social communication structural supports, the four students who were taken through the anti-bullying program were taught what to think, say, and do when approached negatively by another student, and they were also taught to seek out a member of their team of supportive adults. In this way the student was also being taught about self-management. Again, in one of the behavioural-emotional structural supports, both the student who had difficulty in asking the teacher if they could talk together some time and the student who had difficulty expressing to the teacher how he was feeling were supported in doing these things through the use of visual indication systems, and this too was supportive of the student learning about self management. In addition, the social communication curricular that was put in place had the ultimate aim helping students come to understand what it was helpful for them to do when feeling certain emotions. However, emotional self-regulation was difficult for most students in the project and it could not really be claimed that in the course of the project students gained more than "beginning" skills in relation to emotional self management.

An active self-management strategy that was implemented by teachers though related to the teaching of relaxation. In one school brain gym exercises and relaxation exercises every morning were implemented for a small group of students that included the student in the research project. Four other teachers began relaxation exercise times for the whole class. The frequency of this relaxation time varied from every day to several times a week according to what could be fitted in to the weekly schedule. The teaching of relaxation meant that the student with an ASD had a tool that the teacher could encourage them to use at any time; however, mostly teachers found that they still needed to give the student a verbal prompt to encourage them to use a relaxation strategy if the student's

stress was escalating. The teaching of relaxation was also found to be an important tool that could be included in the stress model of behaviour management.

Sensory and Motor Needs/Therapy Curricular Support

In relation to supporting students in the research project who demonstrated sensory dysfunction, occupational therapy support was very limited due to the scarcity of occupational therapists in the region with specific knowledge in relation to sensory support and management. Administration of the Sensory Profile (Dunn, 1999) by the autism consultant indicated considerable sensory difference across a range of sensory domains for many of the students in the project. Although this gave information in regard to areas of potential sensory overload so that structural preventive measures could be put in place, very little was able to be done in the school environment for students in a therapeutic sense. However, one parent introduced 'deep pressure' massage for their child prior to bedtime as a calming technique and this was helpful.

In relation to supporting students who had motor skill deficits, there was some occupational therapy support available to the schools. Two students received additional support for fine and gross motor skill deficits from an occupational therapist who came to the school, and one parent accessed occupational therapy support for her child's fine motor skill problems through accessing an occupational therapist who worked privately.

The autism consultant had some knowledge in this area and was also able to make some suggestions to teachers based on ideas outlined in occupational therapists' reports if these were available in relation to the particular student with an ASD. For one student the teacher introduced the use of coloured thirds for writing tasks, so that the student was supported visually when forming letters. Four teachers also introduced hand exercises for the whole class to help prepare them for handwriting tasks. These were brief exercises designed to engage the children but also to stimulate the muscles in their hands. Teachers reported that these exercises were helpful prior to undertaking writing tasks, especially for children who had difficulty sustaining writing tasks and who had fine motor skill

deficits. They also reported that all of the students enjoyed this activity including the student with an ASD.

Case Study

All the elements of individual support for students that have been outlined illustrate important strategies devised by the collaborative planning and support groups. However, the following case history of one of the students in the project illustrates the importance of a comprehensive plan that includes the development of whole school knowledge and acceptance as well as individually based supports.

Jake (not his real name) was in Grade 3 – his fourth year of schooling. He had received a diagnosis of Asperger's Syndrome prior to the research project beginning and in terms of the standardised diagnosis ascertained in the research. Jake's overall intellectual ability was in the High Average range. His verbal processing skills were well in the Average range and he had experienced no language delay in his early development. His visual processing skills were in the High Average range. He had excellent auditory memory skills and all of his academic skills were age appropriate other than a lower than expected reading comprehension ability. Throughout primary school his teachers had not had great difficulty with him, apart from a few incidents that seemed 'out of the blue'. Over his early primary school years he had been away with illness quite a lot. In the eighteen months prior to the project beginning Jake's mother had been up to the school frequently to express how difficult it was to get him to school. She expressed that he was frequently refusing to go to school and that he could get quite violent toward her in the mornings. This seemed 'odd' to the teachers and the belief had grown in the staffroom that his mother was 'not coping' and that if she was firmer and had better routines then she would manage with Jake as well as they did at school.

However, by the time the project was beginning Jake was refusing altogether to come to school. His school refusal had been sparked by an incident during a whole school assembly. Several children were talking and the teacher leading the assembly had asked for the children who were talking to put up their hand. Jake was not talking but he put his hand up to tell the teacher who was

talking. The reason for him putting up his hand was not ascertained and it was assumed that he put up his hand to indicate that he was talking. He was singled out and made to stand at the side of the group next to another teacher. There was no follow up after this incident to clarify the situation and Jake had felt unfairly singled out and punished. After this he refused to return to school. School refusal then became combined with illness and for several weeks prior to beginning of the research intervention he had not been coming to school at all.

The planning and support group meetings began when Jake was not coming to school. It took three weeks for Jake to return to school but in the meantime several things had begun to happen. The whole staff had received more training about ASDs and Jake's particular situation had been focussed on with staff. Staff understood better that some of the difficulties involved in ASDs can be invisible unless a situation is looked at very closely. They had also begun to see that was important that they understood Jake's difficulties as a whole staff and that each teacher shared to some extent the need to understand a particular student. Jake's mother had also begun to come to the planning and support group meetings and for the first time she felt listened to and supported by the classroom teacher and the school system. Jake's classroom teacher was also growing in understanding of the small signs of body stress that she had observed in Jake but had not realised were important. She was beginning to think about ways to reduce the stress he experienced throughout a day.

Before Jake returned to school, a visible daytime schedule was made for the whole class and times for getting organised prior to class beginning were outlined on this schedule for all the students. Jake had often arrived late to school, so it was planned that he would be given a new responsibility to encourage him to be present at the very start of the school day. Knowledge of computers was a particular area of strength for Jake so he would be made a computer monitor for his classroom teacher and would have some particular morning jobs to do in relation to this. Regular times would also set up for him with a mentor who was a staff member he got on well with. Prior to returning to school Jake also came after school one day to have a special meeting with his classroom teacher in which she

explained her new plans. Jake also had a chance to have a chat with his "mentor" (the assistant principal) who he would meet with regularly.

Another layer of support that was put in place was that Jake's mother was supported by the autism consultant in how to best manage Jake in the mornings at home. In addition, a wider system of community support was also put in place for her so that she could have some respite. Most importantly, though, Jake's mother felt supported by the school system and what was being offered to support Jake and herself. All of this support meant that she was feeling less helpless and was growing in her ability to be loving but firm in her morning plan with Jake.

Three weeks after the project interventions had begun to be put in place Jake did return happily to school, however, not all issues were resolved immediately when Jake returned to school. It was found that the regular meetings of the planning and support group and the better general communication that was set up between home and school were essential in that problems that arose could be dealt with quickly and managed. One incident arose shortly after Jake's return to school in which a staff member on lunchtime duty enforced with Jake a rule about the wearing of hats. This proved to be very upsetting for Jake because he had not understood that the rule was in place at that time and there had been some differences in understanding between staff about the time for beginning to enforce the rule. Although this was very upsetting for Jake, his classroom teacher found out about what had happened. The situation was able to be resolved and an apology was given to Jake about the misunderstanding. Previously these sorts of situations had been allowed to escalate through lack of understanding of the effect of the incident on Jake. In this case the situation was able to be resolved quickly and satisfactorily. The incident also led to a good outcome with the staff because it reinforced the importance of all staff understanding the situation. It also led to a system being put in place in which Jake's classroom teacher was always informed immediately of incidents. As well, a support team of adults was put in place for Jake. This team of adults were ones whom he related to well. The autism consultant made sure that this "team" had a good understanding of Jake's needs and particular difficulties and also knew exactly how he needed to be managed when a crisis arose. Jake was taught about his support team and he was given

cards on a small chain that he could attach to his pocket to remind him of the adults on his "team" that he could find if he needed to talk to someone. This was done to prevent the previous situations in which insufficient staff understanding led to an escalation of Jake's distress.

Many issues came to light during the course of the regular meetings of the planning and support group that could have led to school refusal episodes but they were able to be dealt with before they became bigger issues. These included an array of seemingly small things such as Jake's distress when the classroom tissues for the day ran out, his distress that some students broke the classroom pencils, and his distress with school dress-up days or extra-curricular days. Each of these issues, although seemingly small, was not small to Jake. Other issues which came to light in the course of the regular meetings were more serious. One issue which arose was that Jake had been taken advantage of by some older students when playing Pokemon and certain special cards had been taken unfairly from him. The regular planning and support group meetings enabled the teacher to resolve this issue quickly. The coming to light of this issue also led to a change in school rules about playing Pokemon for all students. As a direct consequence of this issue coming to light the classroom teacher also decided to establish regular classroom times during which the whole class could discuss social issues occurring at school and particularly bullying issues that were of concern to students.

The regular meetings of the planning and support group also allowed for adequate planning time to work out how to prepare Jake for particular school events. For example, planning was done in relation to a forthcoming school camp. It was necessary to discuss ways in which Jake could be prepared for what to expect. It was also necessary to discuss other issues such as where Jake would be best to sit on the bus given his particular sensory sensitivities and how to manage Jake's difficulties in relation to bladder control at night sensitively. If the regular meetings had not been in place, planning such as this would not have occurred.

In summary: There was no school support mechanism or regular program support structure in place for Jake at the start of the research intervention period. Whole school acceptance and understanding, and specific intervention across multiple domains were needed to enable Jake to return happily to school. The

regular meetings of the planning and support group that involved Jake's teacher, Jake's parent, and the autism consultant meant that there was time to address a range of issues that could be supportive for Jake. Through the research project support for Jake's teacher and support for Jake's mother, as well as the whole school interventions, had all been necessary to enable Jake to be supported at school adequately. At the end of the project school was a much safer and happier place for Jake but this would need to continue if this was to remain the case. Fortunately, in this case the school did put in place an ongoing support structure and Jake's classroom teacher nominated to have him again the next school year. The classroom teacher also reported to the autism consultant that she would like to continue to have frequent meetings with Jake's mother in the following year because the facilitation of better communication had been so positive.

CHAPTER 8

EXPERIMENTAL AND REPEATED MEASURES RESULTS

This chapter analyses changes in the students participating in the implementation of the research model. The first part of the chapter analyses the effects on the autistic behaviours of the students with an ASD. The second part of the chapter analyses changes in the executive functioning and problem behaviours of students with an ASD. In both parts, consideration is given to the question of whether the results were any different for students in each of three autistic diagnostic categories, namely, Autistic Disorder, Asperger's Disorder, and ASD-NOS. All results were analysed using the SPSS Graduate Pack 15.0 for Windows.

Effect of the Implementation of the Research Model on Autistic Behaviours

Behaviours specifically related to autism were assessed using the Rated Disco Items. An experiment was carried out to ascertain whether the implementation of the research model resulted in a change in these autistic behaviours which would not have occurred without its implementation. The students participating in the implementation of the research model were divided into two groups of nine students matched broadly according to year level and gender using stratified random sampling. The research model was implemented with Group One during Period One (from Time 1 to Time 2) and during this period Group Two acted as a wait-control group. The research model was also implemented subsequently with Group Two during Period Two (from Time 2 to Time 3). Then, firstly, in an independent groups research design, the changes in the autistic behaviours of Group One students when they participated in the implementation of the research model were compared with the changes in the autistic behaviours of Group Two students when they were a wait-control group. Secondly, in a within-subjects design, the changes in the autistic behaviours of Group Two students when they were a wait-control group were compared with the changes in their autistic behaviours when they participated in the implementation of the research model.

Effect on Group One When They Participated in the Implementation of he Research Model

In order to compare the changes in the autistic behaviours of Group One students when they participated in the implementation of the research model with the changes in the autistic behaviours of Group Two students when they were a wait-control group, the autistic behaviours of all the students were assessed using the Rated Disco Items at Time 1 and Time 2. Descriptive statistics of Group One students' and Group Two students' Rated Disco Items scores in total, in each domain, and in each sub-domain within each domain at Time 1 and Time 2 are set out in Table 8.1.

Changes in Group One students' Rated Disco Items scores from Time 1 to Time 2 were compared to changes in Group Two students' Rated Disco Items scores from Time 1 to Time 2 using a one-way between-groups analysis of covariance (ANCOVA). The independent variable was whether or not the group participated in the research model and the dependent variable consisted of the scores at Time 2. The scores at Time 1 were used as the covariate. This allowed for control of pre-existing differences between the students in each group in relation to autistic behaviours as measured by the Rated Disco Items.

The scores involved in each analysis were checked for normality, homogeneity of variances, and linearity between the dependent variable and the covariate. All scores were found to be normally distributed on the basis that their Shapiro-Wilks statistic was more than .05 except for the scores in one domain and a number of sub-domains as indicated in Table 8.1. Transformation produced a normal distribution in the scores in this domain and in most of these sub-domains. In these cases the transformed scores were analysed and this is indicated in Table 8.1. Analyses were not conducted in relation to three sub-domains in which transformation of the scores did not produce a normal distribution and this is indicated in Table 8.1. The variances of the scores involved in each analysis were found to be homogeneous according to Levene's test except in a few cases. In these few cases, calculation of variance ratios as suggested by Field (2009) showed that the assumption of homogeneity was not violated. The covariate (Rated Disco Items scores at Time 1) in each analysis was found to be strongly

Table 8.1

Descriptive Statistics of Group One Students and Group Two Students' Rated Disco Items Scores at Time 1 and Time 2

Rated Disco Items sub-domain or domain		Group One		Group Two	
	Time	Mean	SD	Mean	SD
Toilet Training	1	4.44	1.33	3.11[a]	0.33
	2	4.11	1.05	3.11[a]	0.33
Feeding	1	7.00	2.65	7.22[a]	3.56
	2	6.22	1.86	7.00	3.43
Dressing	1	7.67	3.00	8.67	2.35
	2	6.78	2.73	8.33	2.00
Hygiene	1	10.22	3.96	8.67	3.12
	2	9.11	2.93	8.67	3.12
Self-Care domain	1	29.33	6.40	27.67	6.40
	2	26.22	4.94	27.11	6.03
Receptive Communication	1	5.78[a]	0.66	6.33	1.00
	2	5.22[a]	0.67	6.33	1.00
Expressive Communication	1	22.89	5.44	21.21	4.86
	2	21.44	5.21	20.72	4.72
Non-Verbal Communication	1	13.33	3.87	13.44	3.40
	2	13.00	3.81	13.33	3.43
Communication domain	1	42.00	7.79	40.99	3.78
	2	39.67	7.93	40.30	4.41
Social Interaction With Adults	1	46.64	7.89	41.50	10.31
	2	44.28	8.82	41.38	10.14
Social Interaction With Age Peers	1	27.43	5.64	23.44	3.88
	2	23.78	4.87	23.22	4.18
Social Play	1	15.31	3.90	14.30	2.88
	2	14.42	3.69	14.19	3.00
Social Interaction domain	1	89.39	14.58	79.24	12.98
	2	82.48	14.64	78.79	12.84
Stereotyped Movements and Vocalisations	1	16.56	5.85	16.00[a]	3.28
	2	16.11	5.40	15.33[a]	3.20
Responses to Proximal Sensory Stimuli	1	28.11	10.14	22.44	3.43
	2	26.78	8.33	22.33	3.35
Responses to Auditory Stimuli	1	6.67[a]	1.73	5.56	2.70
	2	6.33[a]	2.12	5.44	2.74
Responses to Visual Stimuli	1	6.56[a]	3.24	5.33[a]	1.80
	2	6.44[a]	3.32	5.22[a]	1.64
Routines and Resistance to Change	1	50.67	9.73	40.78	9.44
	2	48.33	10.56	40.44	9.19
Emotions	1	19.89	4.57	14.89	3.37
	2	18.11	4.91	15.00	3.28
Overall Pattern of Chosen Activities	1	17.78[a]	3.70	16.56	3.47
	2	17.33[a]	3.43	16.56	3.47
Repetitive, Stereotyped Activities domain	1	146.22	32.52	121.56[a]	15.28
	2	139.44	31.04	120.33[a]	15.00
Behaviour Without Social Awareness	1	42.56	9.36	35.78	7.92
	2	40.56	9.22	35.44	7.63
Behaviour With Social Awareness	1	4.89	1.36	4.00[a]	0.87
	2	4.67	1.41	3.89[a]	0.93
Sleep Disturbances	1	8.22	4.23	7.22[a]	3.31
	2	8.11	3.95	7.22[a]	3.31
Maladaptive Behaviour domain	1	55.67	12.29	47.00	10.03
	2	53.33	11.87	46.56	9.80
Total Rated Disco Items	1	428.64	69.51	378.59	26.01
	2	403.62	62.83	373.80	24.42

Note. Group One, n = 9; Group Two, n = 9; Total Rated Disco Items includes *Other* sub-domains

[a] Scores not normally distributed (Shapiro-Wilks statistic $p < .05$)

related to the dependent variable (Rated Disco Items scores at Time 2) while controlling for group.

A significant difference between the changes in Group One students' Rated Disco Items scores from Time 1 to Time 2 and the changes in Group Two students' Rated Disco Items scores from Time 1 to Time 2 was indicated in relation to the Total Rated Disco Items, $F(1, 15) = 22.063$, $p = .0005$ with a partial eta squared value of .60. Significant differences were also found in relation to each of a number of domains and sub-domains. Significant differences were found in relation to the Self-Care domain, $F(1, 15) = 8.304$, $p = .011$ with a partial eta squared value of .36; the Communication domain, $F(1, 15) = 12.655$, $p = .002$ with a partial eta squared value of .49; and the Social Interaction domain, $F(1, 15) = 13.204$, $p = .002$ with a partial eta squared value of .47. After logarithmic transformation a significant difference was also indicated in relation to the Repetitive, Stereotyped Activities domain, $F(1, 15) = 16.906$, $p = .001$ with a partial eta squared value of .53. Within the Social Interaction domain, significant differences were found in relation to the Social Interaction With Adults sub-domain, $F(1, 15) = 10.817$, $p = .005$ with a partial eta squared value of .42, and the Social Interaction With Age Peers sub-domain, $F(1, 15) = 6.511$, $p = .022$ with a partial eta squared value of .30. Within the Repetitive, Stereotyped Activities domain, a significant difference was found in relation to the Routines and Resistance to Change sub-domain, $F(1, 15) = 15.719$, $p = .001$ with a partial eta squared value of .51, and the Emotions sub-domain, $F(1, 15) = 9.344$, $p = .008$ with a partial eta squared value of .38. Within the Maladaptive Behaviour domain, a significant difference was indicated in the Behaviour Without Social Awareness sub-domain, $F(1, 15) = 5.823$, $p = .029$ with a partial eta squared value of .28. The full results are set out in Table 8.2.

In each case in which a significant difference was indicated, the difference involved a decrease in mean scores and the mean decrease in Group One scores was greater than the mean decrease in Group Two scores. It followed that Group One scores decreased significantly more than Group Two scores in Total, in the Self-Care, Communication, Social Interaction, and Repetitive, Stereotyped Activities domains, and in the Social Interaction With Adults, Social Interaction

Table 8.2

Results of One-way ANCOVAs Comparing Group One's Rated Disco Items Scores from Time 1 to Time 2 with Group Two's Rated Disco Items Scores from Time 1 to Time 2

Rate Disco Items sub-domain or domain	*F*	*p*
Toilet Training[a]	-	-
Feeding	1.749	.209
Dressing	1.952	.183
Hygiene	1.288	.274
Self-Care domain	8.304	.011*
Receptive Communication[a]	-	-
Expressive Communication	2.585	.129
Non-Verbal Communication	.501	.490
Communication domain	14.513	.002*
Social Interaction With Adults	10.817	.005*
Social Interaction With Age Peers	6.511	.022*
Social Play	2.632	.126
Social Interaction domain	13.204	.002*
Stereotyped Movements and Vocalisations[b]	1.346	.264
Responses to Proximal Sensory Stimuli	.230	.638
Responses to Auditory Stimuli[c]	.636	.438
Responses to Visual Stimuli[a]	-	-
Routines and Resistance to Change	15.719	.001*
Emotions	9.344	.008*
Overall Pattern of Chosen Activities[b]	1.124	.306
Repetitive, Stereotyped Activities domain[d]	16.906	.001*
Behaviour Without Social Awareness	5.823	.029*
Behaviour With Social Awareness[b]	.135	.719
Sleep Disturbances[d]	.053	.821
Maladaptive Behaviour domain	2.433	.140
Total Rated Disco Items	22.063	.0005*

Note. Group One, *n* = 9; Group Two, *n* = 9; Total Rated Disco Items includes *Other* sub-domains
[a] Scores not normally distributed and not able to be transformed satisfactorily
[b] Results after square root transformation
[c] Results after inverse transformation
[d] Results after logarithmic transformation
* *p* < .05

With Age Peers, Routines and Resistance to Change, Emotions, and Behaviour Without Social Awareness sub-domains.

Effect on Group Two When They Participated in the Implementation of he Research Model

In order to compare the changes in the autistic behaviours of Group Two students when they were a wait-control group with the changes in their autistic behaviours when they participated in the implementation of the research model, the autistic behaviours of Group Two subjects were assessed using the Rated Disco Items at Time 1, Time 2, and Time 3. Descriptive statistics of Group Two students' Rated Disco Items scores in total, in each domain, and in each sub-domain within each domain at Time 1 and Time 2 and at Time 2 and Time 3 are set out in Table 8.3. Descriptive statistics of their scores in relation to Time 1 and Time 2 are repeated from Table 8.1.

Group Two students' Rated Disco Items scores at Time 1, Time 2, and Time 3 were analysed using a one-way repeated measures ANOVA. The scores involved in each analysis were checked for normality and homogeneity of variances. All scores were found to be normally distributed except for the scores in one domain and a number of sub-domains as indicated in Table 8.3. Transformation produced a normal distribution in the scores in this domain and in most of these sub-domains. In these cases the transformed scores were analysed and this is indicated in Table 8.4. Analysis was not conducted in relation to one sub-domain in which transformation of the scores did not produce a normal distribution or in relation to two sub-domains which had a standard error of difference of zero and this is indicated in Table 8.4.

A significant effect for time in relation to Group Two students' Rated Disco Items scores at Time 1, Time 2, and Time 3 was indicated in relation to the Total Rated Disco Items, Wilk's lambda = .072, $F(2, 16) = 45.304$, $p = .0005$ with a partial eta squared of .93. Significant effects were also indicated in relation to each of a number of domains and sub-domains. Significant effects were indicated in relation to the Self-Care domain, Wilk's lambda = .322, $F(2, 16) = 7.353$, $p = .019$ with a partial eta squared of .68; the Communication domain, Wilk's

Table 8.3

Descriptive Statistics of Group Two Students' Rated Disco Items Scores at Time 1 and Time 2 and at Time 2 and Time 3

Rated Disco Items sub-domain or domain	Time	Mean	SD	Time	Mean	SD
Toilet Training	1	3.11[a]	0.33	2	3.11[a]	0.33
	2	3.11[a]	0.33	3	3.11[a]	0.33
Feeding	1	7.22[a]	3.56	2	7.00	3.43
	2	7.00	3.43	3	6.67	2.83
Dressing	1	8.67	2.35	2	8.33	2.00
	2	8.33	2.00	3	7.78	1.39
Hygiene	1	8.67	3.12	2	8.67	3.12
	2	8.67	3.12	3	7.78	2.91
Self-Care domain	1	27.67	6.40	2	27.11	6.03
	2	27.11	6.03	3	25.33	5.29
Receptive Communication	1	6.33	1.00	2	6.33	1.00
	2	6.33	1.00	3	6.22	0.97
Expressive Communication	1	21.21	4.86	2	20.72	4.72
	2	20.72	4.72	3	19.07	4.49
Non-Verbal Communication	1	13.44	3.40	2	13.33	3.43
	2	13.33	3.43	3	13.11	3.21
Communication domain	1	40.99	3.78	2	40.30	4.41
	2	40.30	4.41	3	38.40	3.68
Social Interaction With Adults	1	41.50	10.31	2	41.38	10.14
	2	41.38	10.14	3	38.46	8.66
Social Interaction With Age Peers	1	23.44	3.88	2	23.22	4.18
	2	23.22	4.18	3	21.44	4.95
Social Play	1	14.30	2.88	2	14.19	3.00
	2	14.19	3.00	3	13.69	3.11
Social Interaction domain	1	79.24	12.98	2	78.79	12.84
	2	78.79	12.84	3	73.59	10.51
Stereotyped Movements and Vocalisations	1	16.00[a]	3.28	2	15.33[a]	3.20
	2	15.33[a]	3.20	3	14.11[a]	2.20
Responses to Proximal Sensory Stimuli	1	22.44	3.43	2	22.33	3.35
	2	22.33	3.35	3	21.67	3.50
Responses to Auditory Stimuli	1	5.56	2.70	2	5.44	2.74
	2	5.44	2.74	3	5.44[a]	2.74
Responses to Visual Stimuli	1	5.33[a]	1.80	2	5.22[a]	1.64
	2	5.22[a]	1.64	3	5.00[a]	1.41
Routines and Resistance to Change	1	40.78	9.44	2	40.44	9.19
	2	40.44	9.19	3	39.33	9.58
Emotions	1	14.89	3.37	2	15.00	3.28
	2	15.00	3.28	3	13.78	2.54
Overall Pattern of Chosen Activities	1	16.56	3.47	2	16.56	3.47
	2	16.56	3.47	3	16.22	3.46
Repetitive, Stereotyped Activities domain	1	121.56[a]	15.28	2	120.33[a]	15.00
	2	120.33[a]	15.00	3	115.56[a]	16.49
Behaviour Without Social Awareness	1	35.78	7.92	2	35.44	7.63
	2	35.44	7.63	3	33.44	6.69
Behaviour With Social Awareness	1	4.00[a]	0.87	2	3.89[a]	0.93
	2	3.89[a]	0.93	3	3.89[a]	0.93
Sleep Disturbances	1	7.22[a]	3.31	2	7.22[a]	3.31
	2	7.22[a]	3.31	3	7.22[a]	3.31
Maladaptive Behaviour domain	1	47.00	10.03	2	46.56	9.80
	2	46.56	9.80	3	44.56	8.99
Total Rated Disco Items	1	378.59	26.01	2	373.80	24.42
	2	373.80	24.42	3	355.10	24.18

Note. n = 9; Total Rated Disco Items includes *Other* sub-domains

[a] Scores not normally distributed (Shapiro-Wilks statistic $p < .05$)

lambda = .140, *F*(2, 16) = 21.494, *p* = .001 with a partial eta squared of .86; the Social Interaction domain, Wilk's lambda = .229, *F*(2, 16) = 11.754, *p* = .006 with a partial eta squared of .77; and the Maladaptive Behaviour domain, Wilk's lambda = .361, *F*(2, 16) = 6.183, *p* = .028 with a partial eta squared of .64. After logarithmic transformation a significant effect was also indicated in relation to the Repetitive, Stereotyped Activities domain, Wilk's lambda = .231, *F*(2, 16) = 11.641, *p* = .006 with a partial eta squared of .77. Within the Communication domain, a significant effect was indicated in the Expressive Communication sub-domain, Wilk's lambda = .183, *F*(2, 16) = 15.668, *p* = .003 with a partial eta squared of .82. Within the Social Interaction domain, a significant effect for time was found in relation to the Social Interaction With Adults sub-domain, Wilk's lambda = .287, *F*(2, 16) = 8.700, *p* = .013 with a partial eta squared of .71, and the Social Interaction With Age Peers sub-domain, Wilk's lambda = .359, *F*(2, 16) = 6.250, *p* = .028 with a partial eta squared of .64. Within the Repetitive, Stereotyped Activities domain, a significant effect was indicated in relation to the Stereotyped Movements and Vocalisations sub-domain after square root transformation of the data, Wilk's lambda = .270, *F*(2, 16) = 9.475, *p* = .010 with a partial eta squared of .73. Within the Maladaptive Behaviour domain, a significant effect was indicated in relation to the Behaviour Without Social Awareness sub-domain, Wilk's lambda = .372, *F*(2, 16) = 5.919, *p* = .031 with a partial eta squared of .63. The full results are set out in Table 8.4.

In each case in which a significant effect was indicated, post hoc analysis using Tukey's HSD Test indicated that there was not a significant effect from Time 1 to Time 2 but there was a significant effect from Time 2 to Time 3. In each case the effect was a decrease. Details of calculated Tukey's HSD values and mean decreases in Group Two students' scores from Time 1 to Time 2 and from Time 2 to Time 3 are set out in Appendix R. It followed that Group Two students' scores did not significantly decrease from Time 1 to Time 2 but did significantly decrease from Time 2 to Time 3 in total, in all the domains, and in the Expressive Communication, Social Interaction With Adults, Social Interaction With Age Peers, Stereotyped Movements and Vocalisations, and Behaviour Without Social Awareness sub-domains.

Table 8.4

Results of One-way Repeated-Measures ANOVAs in Relation to Group Two Students' Rated Disco Items Scores at Time 1, Time 2, and Time 3

Rated Disco Items sub-domain or domain	*F*	*p*	*Partial eta squared*
Toilet Training[a]	-	-	
Feeding[b]	1.749	.242	
Dressing	2.406	.160	
Hygiene	4.414	.069	
Self-Care domain	7.353	.019*	.68
Receptive Communication	1.000	.347	
Expressive Communication	15.668	.003*	.82
Non-Verbal Communication	1.750	.242	
Communication domain	21.494	.001*	.86
Social Interaction With Adults	8.700	.013*	.71
Social Interaction With Age Peers	6.250	.028*	.64
Social Play	2.655	.139	
Social Interaction domain	11.754	.006*	.77
Stereotyped Movements and Vocalisations[c]	9.475	.010*	.73
Responses to Proximal Sensory Stimuli	3.613	.084	
Responses to Auditory Stimuli[d]	1.000	.347	
Responses to Visual Stimuli[e]	-	-	
Routines and Resistance to Change	2.985	.115	
Emotions	3.769	.077	
Overall Pattern of Chosen Activities	4.000	.081	
Repetitive, Stereotyped Activities domain[b]	11.641	.006*	.77
Behaviour Without Social Awareness	5.919	.031*	.63
Behaviour With Social Awareness[c]	1.000	.347	
Sleep Disturbances[e]	-	-	
Maladaptive Behaviour domain	6.183	.028*	.64
Total Rated Disco Items	45.304	.0005*	.93

Note. n = 9; Total Rated Disco Items includes *Other* sub-domains
[a] Analysis could not be conducted because standard error of difference was 0
[b] Results after logarithmic transformation
[c] Results after square root transformation
[d] Results after inverse transformation
[e] Scores not normally distributed and not able to be transformed satisfactorily
* *p* < .05

Comparison of Effects on Group One and Group Two

Given that the implementation of the research model resulted in a significant decrease in the autistic behaviours of the students in both Group One and Group Two, further analysis was conducted to compare the effectiveness of the implementation of the research model for each group. The changes in Group One students' Rated Disco Items scores from Time 1 to Time 2 were compared to the changes in Group Two students' Rated Disco Items scores from Time 2 to Time 3 using an ANCOVA. The independent variable was the implementation of the research model. The dependent variable consisted of the scores at the end of the period in which the research model was implemented with each group. The scores at the start of the period in which the research model was implemented with each group were used as the covariate. Transformed scores were analysed where necessary.

No significant difference was indicated between the changes in Group One students' Rated Disco Items scores from Time 1 to Time 2 and the changes in Group Two students' Rated Disco Items scores from Time 2 to Time 3 in total, in any domain, or in any sub-domain, other than in the Routines and Resistance to Change sub-domain, $F(1, 15) = 6.214$, $p = .025$ with a partial eta squared value of .29. In this sub-domain the mean decrease in Group One scores was greater than the mean decrease in Group Two scores. It followed that Group One scores decreased significantly more than Group Two scores in this sub-domain. Apart from this, the results indicated that the implementation of the research model was equally effective for both groups. Full results of the ANCOVA are set out in Appendix S.

Comparison of Effects on Students in Each Autistic Diagnostic Category

Given that the implementation of the research model was equally effective for both Group One and Group Two, further analysis was conducted to see if it was equally effective for the students in each autistic diagnostic category. With regard to Rated Disco Items scores in total and in each domain, the changes in the scores of the students in each autistic diagnostic category from the start to the end of the implementation of the research model were compared using ANCOVAs.

No significant difference was indicated between the changes in the Rated Disco Items scores of the students in each autistic diagnostic category from the start to the end of the implementation of the research model in total or in any domain. This indicated that the implementation of the research model was equally effective for the students in each autistic diagnostic category.   Full results are set out in Appendix T.

Executive Functioning Before and After the Intervention

Changes in the executive functioning of the students participating in the implementation of the research model were also analysed. Executive functioning was assessed using the BRIEF Teacher Form. In order to determine whether there were changes in the executive functioning of the students in the sample when they participated in the implementation of the research model, the executive functioning of both Group One students and Group Two students was assessed before and after the implementation of the research model in relation to their respective groups. Descriptive statistics of the BRIEF Teacher Form clinical scale T scores, index composite T scores, and global composite T scores of the students in the whole sample and in each autistic diagnostic category before and after the implementation of the research model are set out in Table 8.5. The scores before the implementation of the research model are repeated from Table 6.11.

Changes in the students' executive functioning were analysed using a mixed between-within subjects ANOVA, sometimes referred to as a split-plot ANOVA, or SPANOVA. The independent between-subjects variable was the autistic diagnostic category. The independent within-subjects variable was time, that is, before or after the implementation of the research model. The dependent variable was the BRIEF Teacher Form T score. The analysis tested three things. Firstly, the analysis tested whether there was a main effect for autistic diagnostic category, that is, whether there was a difference between the students in each autistic diagnostic category in relation to their BRIEF T scores. Secondly, the analysis tested whether there was a main effect for time, that is, whether there was a change in the scores of the whole sample from before to after the implementation of the research model. Thirdly, the analysis tested whether there was an

Table 8.5

Descriptive Statistics of BRIEF Teacher Form T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample Before and After Implementation of Research Model

BRIEF Teacher Form clinical scale or composite	Time	Students with AD (*n* = 7)		Students with AS (*n* = 7)		Students with ASD-NOS (*n* = 4)		Whole sample (*n* = 18)	
		Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Inhibit	*Pre*	51.71	7.30	61.14	11.45	60.00	3.74	57.22	9.39
	Post	50.86	7.24	60.71	8.06	56.25	2.22	55.89	7.90
Shift	*Pre*	70.00	15.12	71.00	10.82	75.75	19.62	71.67	13.97
	Post	69.57	10.49	73.57	6.37	72.00	13.30	71.67	9.36
Emotional Control	*Pre*	63.14	13.37	65.43	7.93	61.25	5.85	63.61	9.75
	Post	62.29[a]	14.52	66.57	7.48	62.00	8.60	63.89	10.59
Behaviour Regulation Index	*Pre*	61.57	12.03	67.71	9.55	66.75	6.13	65.11	9.92
	Post	61.00	11.20	69.00	7.48	64.00	5.29	64.78	9.07
Initiate	*Pre*	69.71	10.61	69.00	10.10	72.75	7.41	70.11	9.36
	Post	68.29	9.32	66.14	8.53	71.75	9.71	68.22	8.82
Working Memory	*Pre*	71.29	10.50	65.71	8.94	79.50	7.51	70.94	10.28
	Post	70.00	8.94	63.86	11.54	75.00	15.64	68.72	11.75
Plan/Organise	*Pre*	69.14	11.88	70.86	6.89	72.00	6.38	70.44	8.67
	Post	67.29	11.49	67.00	6.33	70.25	6.24	67.83	8.33
Organisation of Materials	*Pre*	59.86	8.53	68.14	10.07	67.25	7.41	64.72	9.34
	Post	60.14	6.72	64.57	4.72	65.00	13.34	62.94	7.78
Monitor	*Pre*	60.29	6.47	70.29	9.41	74.50	6.25	67.33	9.44
	Post	61.29	5.55	66.86	8.36	73.75	14.77	66.22	9.88
Metacognition Index	*Pre*	67.14	8.71	70.57	7.89	76.00	6.16	70.44	8.20
	Post	66.43	6.11	67.14	8.03	73.75	12.34	68.33	8.47
Global Executive Composite	*Pre*	65.86	8.21	71.14[a]	7.71	74.50[a]	3.70	69.83	7.72
	Post	65.43	7.28	69.29	8.28	71.75	8.46	68.33	7.88

Note. AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified
[a] Scores not normally distributed (Shapiro-Wilk's statistic *p* < .05)

interaction between autistic diagnostic category and time, that is, whether there was a difference between the students in each autistic diagnostic category in relation to the change in each student's scores from before to after the implementation of the research model.

The assumptions of normality, homogeneity of variances, and homogeneity of inter-correlations were checked and found not to be violated except that some scores were not normally distributed as indicated in Table 8.5

The results of the SPANOVAs in relation to the BRIEF Teacher Form clinical scale *T* scores, index composite *T* scores, and global composite *T* scores were as follows. Firstly, there were no significant main effects for autistic diagnostic category except in relation to the Monitor clinical scale, $F(2, 15) = 4.522$, $p = .029$ with a partial eta squared of .38. The *T* scores in this case were normally distributed. Post hoc comparisons using Tukey's HSD test indicated that the students with ASD-NOS had significantly higher Monitor clinical scale *T* scores than the students with Autistic Disorder. Secondly, there were no significant main effects for time. Thirdly, there were no significant interaction effects between autistic diagnostic category and time. The statistical results are set out in full in Appendix U.

Problem Behaviours Before and After the Intervention

Changes in the problem behaviours of the students participating in the implementation of the research model were also analysed. Problem behaviours were assessed using both the ASEBA-TRF, which was completed by teachers, and the ASEBA-CBCL, which was completed by parents. Assessments were conducted for both Group One students and Group Two students before and after the implementation of the research model in relation to their respective groups.

Problem Behaviours Reported by Teachers

Descriptive statistics of the ASEBA-TRF syndrome scale T scores, grouping of syndrome T scores, and total T scores of the students in the whole sample and in each autistic diagnostic category before and after the implementation of the research model are set out in Table 8.6. The scores before the implementation of the research model are repeated from Table 6.14.

The ASEBA-TRF *T* scores were analysed in the same way as the BRIEF *T* scores using SPANOVAs. The independent between-subjects variable was the autistic diagnostic category and the independent within-subjects variable was

Table 8.6

Descriptive Statistics of ASEBA-TRF T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample Before and After Implementation of Research Model

ASEBA-TRF syndrome scale or grouping of syndromes	Time	Students with AD (*n* = 7)		Students with AS (*n* = 7)		Students with ASD-NOS (*n* = 4)		Whole sample (*n* = 18)	
		Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Anxious/ Depressed	*Pre*	64.57[a]	10.49	67.00	8.58	59.00	10.83	64.28	9.76
	Post	64.57	10.41	66.29[a]	8.92	56.25	7.37	63.39	9.59
Withdrawn/ Depressed	*Pre*	62.86	11.38	58.71	6.82	57.00	6.48	59.94[a]	8.70
	Post	64.14	7.71	59.57	5.86	55.25	6.70	60.39	7.30
Somatic Complaints	*Pre*	55.14[a]	7.56	57.29[a]	10.81	60.75	8.69	57.22[a]	8.91
	Post	55.14[a]	7.56	58.71	10.56	62.00	14.24	58.06[a]	10.13
Social Problems	*Pre*	62.00	5.66	61.00	5.03	60.25[a]	7.81	61.22	5.61
	Post	58.29	7.02	62.43	4.72	58.25	6.95	59.89	6.17
Thought Problems	*Pre*	68.86	11.47	65.29	10.36	64.00	13.37	66.39	10.96
	Post	67.29	10.87	67.43	8.00	61.25[a]	8.50	66.00	9.16
Attention Problems	*Pre*	59.71	3.77	61.14	6.07	66.00	5.83	61.67	5.49
	Post	58.43	3.95	60.43	6.24	63.00	6.38	60.22	5.44
Rule-Breaking Behaviour	*Pre*	54.29	4.54	57.29	4.54	55.00	3.74	55.61[a]	4.35
	Post	54.57	5.41	56.71	4.54	53.50	2.65	55.17[a]	4.54
Aggressive Behaviour	*Pre*	58.00	7.26	58.43	5.59	60.50[a]	0.58	58.72	5.54
	Post	56.71	6.65	58.00	4.83	56.25	3.95	57.11	5.21
Internalising	*Pre*	62.86[a]	11.51	65.00	6.63	60.50	14.20	63.17	10.05
	Post	64.00	9.90	65.14	6.59	57.50	11.96	63.00	9.20
Externalis-Ing	*Pre*	56.43	7.37	58.29	5.19	59.50[a]	0.58	57.83	5.50
	Post	54.43	8.87	58.57	3.87	55.50	3.87	56.28	6.28
Total Problems	*Pre*	62.43	7.64	63.86	4.71	63.50	6.56	63.22	6.04
	Post	61.14	8.24	63.86	4.45	59.25	7.37	61.78	6.63

Note. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other, AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified

[a] Scores not normally distributed (Shapiro-Wilk's statistic *p* < .05)

time. The dependent variable was the ASEBA-TRF T score. The assumptions of normality, homogeneity of variances, and homogeneity of intercorrelations were checked and found not to be violated except that some scores were not normally distributed as indicated in Table 8.6.

The results of the SPANOVAs in relation to the ASEBA-TRF syndrome scale T scores, grouping of syndrome T scores, and total T scores were as follows. Firstly, there were no significant main effects for autistic diagnostic category. Secondly, there were significant main effects for time in relation to Total Problems, Wilk's Lambda = .627, $F(1, 15) = 8.921$, $p = .009$ with a partial eta squared of .37; the Externalising grouping of syndromes after inverse transformation, Wilk's Lambda = .684, F(1, 15) = 6.928, $p = .019$ with a partial eta squared of .32; the Attention Problems syndrome scale, Wilk's Lambda = .751, $F(1, 15) = 4.970$, $p = .042$ with a partial eta squared of .25; and the Aggressive Problems syndrome scale after logarithmic transformation, Wilk's Lambda = .618, $F(1, 15) = 9.281$, $p = .008$ with a partial eta squared of .38. Thirdly, there were no significant interaction effects between autistic diagnostic category and time. The results of the SPANOVAs are set out in full in Table 8.7.

Problem Behaviours Reported by Parents

Descriptive statistics of the ASEBA-CBCL syndrome scale T scores, grouping of syndrome T scores, and total T scores of the students in the whole sample and in each autistic diagnostic category before and after the implementation of the research model are set out in Table 8.8. The scores before the implementation of the research model are repeated from Table 6.15.

The ASEBA-CBCL T scores were analysed in the same way as the ASEBA-CBCL T scores using SPANOVAs. The independent between-subjects variable was the autistic diagnostic category and the independent within-subjects variable was time. The dependent variable was the ASEBA-CBCL T score. The assumptions of normality, homogeneity of variances, and homogeneity of intercorrelations were checked and found not to be violated except that some scores were not normally distributed as indicated in Table 8.8.

The results of the SPANOVAs in relation to the ASEBA-CBCL syndrome

Table 8.7

Results of SPANOVAs in Relation to ASEBA-TRF T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample Before and After Implementation of Research Model

ASEBA-TRF syndrome scale or grouping of syndromes	Effect	Wilks' Lambda	F	df (hyp)	df (error)	p	Partial eta squared
Anxious/Depressed [a]	Time	.952	.757	1	15	.398	
	Time^Diagnosis	.955	.357	2	15	.705	
	Diagnosis		1.196	2	15	.330	
Withdrawn/Depressed [b]	Time	.996	.054	1	15	.819	
	Time^Diagnosis	.885	.977	2	15	.399	
	Diagnosis		1.293	2	15	.303	
Somatic Complaints [b]	Time	.791	3.961	1	15	.209	
	Time^Diagnosis	.873	1.094	2	15	.360	
	Diagnosis		2.297	2	15	.135	
Social Problems [b]	Time	.935	1.047	1	15	.322	
	Time^Diagnosis	.840	1.428	2	15	.271	
	Diagnosis		.357	2	15	.710	
Thought Problems	Time	.980	.308	1	15	.587	
	Time^Diagnosis	.849	1.338	2	15	.292	
	Diagnosis		.371	2	15	.696	
Attention Problems	Time	.751	4.970	1	15	.042*	.25
	Time^Diagnosis	.912	.723	2	15	.501	
	Diagnosis		1.435	2	15	.269	
Rule-Breaking Behaviour [b]	Time	.916	1.380	1	15	.258	
	Time^Diagnosis	.898	.849	2	15	.447	
	Diagnosis		.778	2	15	.477	
Aggressive Behaviour [b]	Time	.618	9.281	1	15	.008*	.38
	Time^Diagnosis	.724	2.865	2	15	.088	
	Diagnosis		.094	2	15	.911	
Internalising [c]	Time	.970	.467	1	15	.505	
	Time^Diagnosis	.841	1.414	2	15	.274	
	Diagnosis		.433	2	15	.656	
Externalising [d]	Time	.684	6.928	1	15	.019*	.32
	Time^Diagnosis	.726	2.824	2	15	.091	
	Diagnosis		.750	2	15	.489	
Total Problems	Time	.627	8.921	1	15	.009*	.37
	Time^Diagnosis	.675	3.608	2	15	.053	
	Diagnosis		.258	2	15	.776	

Note. Autistic Disorder, $n = 7$; Asperger's Disorder, $n = 7$; Autistic Spectrum Disorder – Not Otherwise Specified, $n = 4$; Whole sample, $n = 18$; Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other

[a] Results after reflect and square root transformation

[b] Results after logarithmic transformation

[c] Results after reflect and square root transformation

[d] Results after inverse transformation

*$p < .05$

Table 8.8

Descriptive Statistics of ASEBA-CBCL T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample Before and After Implementation of Research Model

ASEBA-TRF syndrome scale or grouping of syndromes	Time	Students with AD (*n* = 7)		Students with AS (*n* = 7)		Students with ASD-NOS (*n* = 4)		Whole sample (*n* = 18)	
		Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Anxious/ Depressed	*Pre*	53.71[a]	5.16	73.00	11.53	64.75	10.47	63.67	12.35
	Post	52.71[a]	4.65	71.43	11.77	64.00[a]	10.74	62.50[a]	12.23
Withdrawn/ Depressed	*Pre*	61.43	6.88	67.43	9.43	58.00	4.32	63.00	8.15
	Post	58.43	5.19	66.29	8.04	61.00	4.76	62.06	7.03
Somatic Complaints	*Pre*	55.29[a]	7.20	66.14	10.29	67.75	6.24	62.28	9.79
	Post	55.14[a]	6.96	66.29	9.03	65.25	8.85	61.72[a]	9.44
Social Problems	*Pre*	58.57	1.40	72.14	7.52	73.00	2.45	67.06[a]	8.38
	Post	57.14	2.19	70.57	5.74	71.50	5.20	65.56	8.12
Thought Problems	*Pre*	64.43	6.55	74.14	10.73	73.00	5.10	70.11	9.07
	Post	63.71	6.70	72.43	10.57	71.50	2.65	68.83	8.62
Attention Problems	*Pre*	68.00	6.16	67.43	5.65	79.25	8.66	70.28	7.90
	Post	63.71[a]	4.19	64.29	6.95	76.00	5.77	66.67	7.45
Rule-Breaking Behaviour	*Pre*	51.86[a]	2.48	66.71	5.31	66.00	6.06	60.78[a]	8.50
	Post	51.57[a]	2.44	64.71	7.02	66.25	6.40	59.54[a]	8.62
Aggressive Behaviour	*Pre*	57.29	7.93	72.14	9.60	70.25	4.65	65.94	10.47
	Post	55.29	5.82	68.71	8.16	69.50	3.87	63.67	9.25
Internalising	*Pre*	56.43	7.96	72.14	9.96	66.25	6.19	64.72	10.75
	Post	54.00	6.66	70.14[a]	9.81	66.00	6.38	62.94	10.64
Externalis-ing	*Pre*	52.57	11.82	70.29	6.47	70.50	1.29	63.44[a]	12.00
	Post	50.86	10.86	68.29[a]	7.76	70.00	1.41	61.89[a]	11.89
Total Problems	*Pre*	58.71[a]	6.85	73.71[a]	7.16	73.00	1.63	67.72[a]	9.48
	Post	56.43	6.19	71.14[a]	8.05	72.75	2.06	65.78[a]	9.82

Note. Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other, AD = Autistic Disorder, AS = Asperger's Disorder, ASD-NOS = Autistic Spectrum Disorder – Not Otherwise Specified

[a] Scores not normally distributed (Shapiro-Wilk's statistic $p < .05$)

scale T scores, grouping of syndrome T scores, and total T scores were as follows. Firstly, there were several significant main effects for autistic diagnostic category. The SPANOVA results are given in Table 8.9. Post hoc comparisons using Tukey's HSD test indicated that students with Asperger's Disorder and students with ASD-NOS had significantly higher T scores than students with Autistic Disorder in relation to the Externalising grouping of syndromes and in relation to the Social Problems and Aggressive Behaviour syndrome scales. Post hoc comparisons also indicated that students with Asperger's Disorder had significantly higher T scores than students with Autistic Disorder in relation to the Internalising grouping of syndromes and in relation to the Anxious/Depressed syndrome scale. Post hoc comparisons also indicated that students with ASD-NOS had significantly higher T scores than students with Autistic Disorder and students with Asperger's Disorder in relation to the Attention Problems syndrome scale.

Secondly, there were significant main effects for time in relation to the Thought Problems syndrome scale, Wilk's Lambda = .765, $F(1, 15) = 4.604$, $p = .049$, with a partial eta squared of .24; the Attention Problems syndrome scale after reflect and inverse transformation, Wilk's Lambda = .503, $F(1, 15) = 14.793$, $p = .002$, with a partial eta squared of .47; and the Aggressive Behaviour syndrome scale, Wilk's Lambda = .724, $F(1, 15) = 5.732$, $p = .030$, with a partial eta squared of .28.

Thirdly, there was one significant interaction effect between autistic diagnostic category and time in relation to the Withdrawn/Depressed syndrome scale (Wilk's Lambda = .598, $F(2, 15) = 5.047$, $p = .021$, with a partial eta squared of .40). Examination of the estimated marginal means and the profile plot indicated that the T scores of the students with Autistic Disorder and the T scores of the students with Asperger's Disorder decreased significantly more than the T scores of the students with ASD-NOS.

Given that the ASEBA-CBCL Total Problems T scores and Rule-Breaking Behaviour syndrome scale T scores were not normally distributed, non-parametric analysis using the Wilcoxon Signed-Rank Test was undertaken to analyse changes

Table 8.9

Results of SPANOVAs in Relation to ASEBA-CBCL T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample Before and After Implementation of Research Model

ASEBA-CBCL syndrome scale or grouping of syndromes	Effect	Wilks' Lambda	F	df (hyp)	df (error)	p	Partial eta squared
Anxious/Depressed[a]	Time	.856	2.528	1	15	.133	
	Time^Diagnosis	.991	0.068	2	15	.935	
	Diagnosis		9.278	2	15	.002*	.55
Withdrawn/Depressed	Time	.982	0.267	1	15	.613	
	Time^Diagnosis	.598	5.047	2	15	.021*	.40
	Diagnosis		2.269	2	15	.138	
Somatic Complaints	Time	.951	0.771	1	15	.394	
	Time^Diagnosis	.938	0.497	2	15	.618	
	Diagnosis		3.496	2	15	.057	
Social Problems[b]	Time	.883	1.987	1	15	.179	
	Time^Diagnosis	.995	0.039	2	15	.962	
	Diagnosis		19.780	2	15	.000*	.73
Thought Problems	Time	.765	4.604	1	15	.049*	.24
	Time^Diagnosis	.962	0.300	2	15	.745	
	Diagnosis		2.605	2	15	.258	
Attention Problems[c]	Time	.503	14.793	1	15	.002*	.47
	Time^Diagnosis	.979	0.164	2	15	.850	
	Diagnosis		7.584	2	15	.005*	.50
Rule-Breaking Behaviour[d]	Time	-	-	-	-	-	
	Time^Diagnosis	-	-	-	-	-	
	Diagnosis		-	-	-	-	
Aggressive Behaviour	Time	.724	5.732	1	15	.030*	.28
	Time^Diagnosis	.907	0.770	2	15	.480	
	Diagnosis		8.056	2	15	.004*	.52
Internalising[b]	Time	.821	3.272	1	15	.091	
	Time^Diagnosis	.938	0.494	2	15	.620	
	Diagnosis		6.887	2	15	.008*	.48
Externalising[c]	Time	.776	4.318	1	15	.055	
	Time^Diagnosis	.934	0.511	2	15	.610	
	Diagnosis		13.480	2	15	.000*	.64
Total Problems[d]	Time	-	-	-	-	-	
	Time^Diagnosis	-	-	-	-	-	
	Diagnosis		-	-	-	-	

Note. Autistic Disorder, $n = 7$; Asperger's Disorder, $n = 7$; Autistic Spectrum Disorder – Not Otherwise Specified, $n = 4$; Whole sample, $n = 18$; Internalising = Anxious/Depressed + Withdrawn/Depressed + Somatic Complaints, Externalising = Rule-Breaking Behaviour + Aggressive Behaviour, Total Problems = All syndrome scales + Other

[a] Results after inverse transformation

[b] Results after reflect and square root transformation

[c] Results after reflect and inverse transformation

[d] Data could not be transformed to ensure normality

*$p < .05$

in these scores. It was found that the Total Problems T scores decreased significantly (pre-intervention median = 73.00, inter-quartile range = 18; post-intervention median = 70.00, inter-quartile range = 20; $z = -2.553$, $p = .001$). However, the Rule-Breaking Behaviour syndrome scale T scores did not decrease significantly (pre-intervention median = 61.00, inter-quartile range = 19; post-intervention median = 59.00, inter-quartile range = 19; $z = -1.866$, $p = .062$).

CHAPTER 9
SURVEY RESULTS

Teacher Responses to the Whole School Session "Building the Big Picture"

There were seventeen responses from teachers to the "Building the Big Picture" survey (Appendix J). Responses were gathered from a school principal, from the team leader of the primary school campus of a P-12 school, and from fifteen of the participating teachers. Among these responses there was a response from at least one participating teacher in each of the nine schools that took part in the project. The responses were gathered two to four weeks after the session occurred.

Relevance of the Session to Teachers

Question 1 of the survey asked the teachers whether the whole staff session about "Building the Big Picture" in relation to a student with Autism Spectrum Disorder was relevant to them. All of the teachers said that the session was relevant to them. A follow-up question asked how it was relevant. Responses included:

> *[It gave me] an overview as team leader, allowing me to understand and support staff and students.*
> *It gave valuable background information to all staff.*
> *[It] opened up whole school dialogue.*

What Teachers Gained from the Session

A further follow-up question asked what the teachers gained from the session. Eleven teachers mentioned that they gained knowledge and understanding, four mentioned that they gained help with intervention strategies, and two mentioned that they found it helpful to realise they had support and understanding from other staff. Responses included:

> *[We have to] take time to understand these students.*

[It gave] support, and also a chance to listen to all staff about their knowledge, fears, etc.

I got to know information about the student I didn't know [and] other teachers [gave] insight.

Change in Teachers' Practice

Question 2 of the survey asked the teachers whether thinking in terms of the "big picture" had changed their practice in relation to either a student with ASD or a student with any other form of disability. Fourteen teachers responded that it had changed their practice. One of the three teachers who responded that it had not changed their practice explained that it had re-affirmed her beliefs and practices. A follow-up question to those who responded that it had changed their practice asked in what ways it had done so. Twelve teachers responded. Of those, five teachers explained that they had more ideas about teaching strategies, four explained that they had gained more understanding and knowledge of ASDs, two explained that they understood more about the anxiety of the student with an ASD, and one explained that he was now more willing to seek assistance from other teachers.

Question 2 also asked the teachers whether they thought thinking in terms of the "big picture" changed the practice of other teachers. Sixteen teachers responded that they thought that it had. A follow-up question asked the teachers in what ways they had noticed this. Of the sixteen teachers who responded, eleven teachers had noticed that other teachers had become more understanding and less critical and one teacher had noticed that there was more discussion between teachers. Four teachers had noticed that other teachers had become more aware that the student with an ASD was the responsibility of all staff and not just the classroom teacher.

What was Missing from the Session

Question 3 of the survey asked the teachers whether there was anything missing from the session that they would have liked more discussion about. Ten teachers responded that there was nothing missing, six teachers indicated that

there was something missing, and one teacher did not respond. A follow-up question asked the teachers whether they could explain further. Two teachers would have liked more information about what to do – whether in the classroom or when "handling certain situations", one asked how the education department "resources the needs of these students", one commented that the facilitators assumed that nothing had already been done for these students, one commented that the session was too short, and one commented that teachers had been left "feeling overwhelmed with the issues" that still needed to be worked on.

Teachers' Responses to Surveys Before and After the Intervention

All of the teachers involved in the intervention (eighteen teachers) completed Teacher Survey 1 (Appendix F) before the intervention and Teacher Survey 2 (Appendix G) after the intervention.

Helpfulness of Knowing a Student's Diagnosis

Question 1 of the pre-intervention survey asked the teachers if they had previously had a student with Autistic Disorder, Asperger's Disorder/Syndrome, or any other Autism Spectrum Disorder (ASD) in their class. Thirteen teachers indicated that they had and five indicated that they had not.

Question 2 of the pre-intervention survey asked any teachers who had previously had a student with an ASD in their class whether they thought it was helpful to know the student's diagnosis. All of these teachers who had previous experience (thirteen teachers) indicated that they thought it was. Similarly, Question 1 of the post-intervention survey asked the teachers whether they thought it was helpful to know the student's diagnosis. All of the participating teachers (eighteen teachers) indicated that they thought it was. A follow-up question in each survey asked why it was helpful. All of the reasons given by teachers related to the benefit of understanding the student better and of being able to plan for the student more appropriately. One teacher wrote that knowing the diagnosis helped them understand that the student's behaviours were "signs of stress and uncertainty" rather than "misbehaviours".

Knowledge about the Intellectual Ability Range of Students with Autism Spectrum Disorders

Question 3 of the pre-intervention survey asked the teachers what they understood to be the range of intellectual ability that a student with an ASD may have. Eleven teachers responded that there is a large range in the intellectual ability that a student with an ASD may have. Seven teachers did not have this understanding. One responded that students with an ASD may have intellectual ability which is low or high but not in the middle of the range, another responded that they have varying intellectual ability but they can function academically at an average level, another responded that they have low intellectual ability, another responded that they can have high intellectual ability but are not necessarily able to express anything, and three teachers did not answer the question. Question 2 of the post-intervention survey asked the same question. All of the teachers understood that there could be a large range in the intellectual ability of students with an ASD.

Specific Areas of Knowledge about Autism Spectrum Disorders

Question 5 of the pre-intervention survey asked the teachers to indicate from a range of options how they had gained their knowledge about ASDs. (More than one option could be ticked.) Thirteen teachers indicated that they had gained their knowledge through having had a child with an ASD in their class, eleven reported that they had gained their knowledge through books, ten reported having gained their knowledge through professional development, and small numbers of teachers reported having gained their knowledge through the internet, through television, or through personal involvement.

Question 4 of the pre-intervention survey and Question 3 of the post-intervention survey asked the teachers to indicate the level of knowledge they had in regard to ASDs in a number of areas. The teachers indicated whether they had no knowledge, some knowledge, or much knowledge. For each level of knowledge, the number of teachers who indicated this level is set out in Table 9.1.

Table 9.1

Numbers of Teachers Before and After Intervention Having Specific Knowledge about Autism Spectrum Disorders

Area of knowledge	Level of knowledge	Before intervention	After intervention
Knowledge about general features of the condition	*Much*	1	10
	Some	16	8
	None	1	0
Knowledge about the variation in presentation of the condition of ASD	*Much*	1	11
	Some	14	7
	None	3	0
Knowledge about specific educational interventions that may help the child in an educational context	*Much*	1	9
	Some	14	9
	None	3	0
Knowledge about the specific sensory difficulties that students with ASD may have	*Much*	0	8
	Some	15	10
	None	3	0
Knowledge about students with ASD having scattered skills	*Much*	1	9
	Some	14	9
	None	3	0
Knowledge about how to change the environment to provide supportive structures for the student	*Much*	0	10
	Some	14	8
	None	4	0
Knowledge about management of specific behaviours	*Much*	1	10
	Some	13	8
	None	4	0

Note. n =18

It can be seen from these responses that teachers mostly had some knowledge in all of these areas prior to the research intervention. Pre-intervention response figures range from 5 to 22% indicating *no knowledge,* 72 to 89% indicating *some knowledge,* and 0 to 5% indicating *much knowledge* in the various

areas. In the post-intervention responses teachers indicated marked gains through the process with 0% of teachers indicating *no knowledge* in any area, 38 to 56% indicating *some knowledge*, and 44 to 61% of the teachers indicating *much knowledge* in the various areas.

Need for More Specific Training in Particular Areas

Question 6 of the pre-intervention survey asked the teachers whether they felt a need for more specific training in any particular area. Sixteen teachers indicated that they did need more training to support students with an ASD. A follow-up question asked teachers to outline the areas in which they felt they needed more training. Nine teachers mentioned needing more training in strategies and teaching methods and two mentioned needing more training in coping with difficult behaviours. The following areas in which there was a need for more training were each mentioned by one teacher: social skill development, sensory difficulties, language, stress and anxiety, and learning difficulties.

Question 7 of the post-intervention survey asked the teachers whether they felt an ongoing need for more specific training in any particular areas in order to support students with an ASD. Thirteen teachers indicated that they did. In a follow-up question these teachers were asked to comment on the areas in which they felt they needed more training. Of the ten teachers that responded, three teachers commented that there would always be more to learn and three teachers commented that each student with an ASD presents differently so they would need ongoing support. The following areas of need for ongoing support were each mentioned by one teacher: behavioural difficulties, preparing students for puberty, access to resources/materials, and technology supports.

Post-Intervention Understanding of Educational Interventions

Question 4 of the post-intervention survey asked the teachers to comment about their current understanding of specific educational interventions that may be helpful for a student with an ASD. All of the teachers responded to this question and many gave examples. Eight teachers mentioned having learned about the helpfulness of particular kinds of visual supports. Eight teachers mentioned the

importance of interventions that take account of particular ways of making language accommodations (e.g., in giving clear instructions, in waiting for an answer, and by giving visual cues). Four teachers mentioned structuring the environment or particular ways of structuring the environment. Particular ways of structuring the environment that were mentioned were planning the school day, using a visual timetable, and creating a "touch and feel" sensory area. Two teachers mentioned providing calming times or relaxation activities. Two teachers mentioned social stories. Two teachers mentioned the need for additional intervention support through a particular kind of professional support, viz. occupational therapy support. Two teachers mentioned the use of technology to help in interventions. One teacher mentioned understanding stress triggers for students with an ASD. One teacher mentioned having learned about the importance of devising individual programs.

Access to Professional Support

Question 7 of the pre-intervention survey asked those teachers who had previously had a student with an ASD in their class whether they had access to professional support. Ten of the thirteen teachers who had previously had a student with an ASD in their class indicated that they had some access to professional support, but four of these ten teachers added that the support was "limited". A follow-up question asked in what specific areas they had received professional support. The professionals from whom teachers said they had received some support were psychologists, speech pathologists, an occupational therapist, and their school's integration teacher. A further follow-up question asked if there were any other areas in which they would have liked to have had additional professional support. Seven teachers indicated that they would have liked more support.

Question 5 of the post-intervention survey asked the teachers whether they felt greater access to professional support through the research project had been of benefit to them as teachers. All of the eighteen teachers indicated that it had been of benefit. A follow-up question asked them to explain how it had been of benefit. Most teachers said that they understood their students better and understood more

about why they might behave in certain ways. Others mentioned the benefit they had received in relation to resources and strategies. The following specific responses reflect both what was learned and the collaborative style of the planning and support group meetings.

> *The psychologist's [autism consultant's] knowledge led to increased knowledge and was a sounding board.*
>
> *It provided an opportunity to discuss and analyse as well as to plan a program. I've discovered new strategies, resources and knowledge.*
>
> *The fortnightly meetings were a fabulous time for sharing problems and ideas.*
>
> *It has been fantastic to have someone to bounce ideas off and to learn from.*
>
> *It was good to be able to bounce ideas. It was also helpful to make the visual aids together because it is so time consuming to make them on your own. It was very pupil orientated and classroom friendly. It was good to have regular follow-up.*

Needs of Students with Autism Spectrum Disorders

Question 8 of the pre-intervention survey asked the teachers what they thought were the main needs of a student with an ASD. Seven teachers mentioned the student's need for structure and/or routine. Four teachers mentioned the student's need for social skill development. The following needs were each mentioned by two teachers: the student's need for peer support, the student's need for a supportive environment, the student's need for modified work, and the student's need to be able to work at their own pace. There were also a range of other needs which were each mentioned by one teacher. These included the student's need for repetition, the student's need for organisational skills, the student's need for improvement in fine motor skills, and the student's need for behaviour management.

Question 6 of the post-intervention survey asked the same question about the needs of a student with an ASD. Some of the needs mentioned were the same as those mentioned in pre-intervention responses, but these responses were not

necessarily made by the same teachers. Seven teachers mentioned the student's need for structure and/or routine, three teachers mentioned the student's need for social skill development, and one teacher mentioned the student's need for peer support. Other needs mentioned in post-intervention responses were not mentioned in pre-intervention responses. Five teachers mentioned the student's need for adapted instructions. Five teachers mentioned the student's need to be able to work at their own pace. Four teachers mentioned the student's need for visual supports. Four teachers mentioned the student's need for a calming space. Three teachers mentioned the need to have the student's stress response managed. Three teachers mentioned the need for good home-school communication. One teacher mentioned the student's need for "laughter and stimulation".

Need to Modify the Classroom Environment

Question 9 of the pre-intervention survey asked the teachers whether they felt it was important to modify the classroom environment for students who have an ASD. Fourteen teachers indicated that they did think it was important to modify the classroom environment. A follow-up question asked the teachers whether they felt they had received enough training about this. Only two teachers indicated that they felt they had received enough training about modifying the classroom environment. Question 9 of the post-intervention survey asked the teachers whether they had more ideas now about how the classroom environment could be modified to best suit a student with ASD. All of the eighteen teachers indicated that they did.

In the pre-intervention survey a follow-up question about the need to modify the classroom environment asked teachers how they thought this could be done. A parallel question in the post-intervention survey asked the same question. Some ways of modifying the environment mentioned by teachers before the intervention were the same as those mentioned by teachers after the intervention, but the particular ways mentioned were not necessarily mentioned by the same teachers. The importance of the need to modify the classroom environment through the use of visual supports was mentioned by four teachers in pre-intervention responses and by eight teachers in post-intervention responses. A

quiet area was mentioned by three teachers in pre-intervention responses and by six teachers in post-intervention responses. Minimising noise was mentioned by two teachers in pre-intervention responses and by two teachers in post-intervention responses. Post-intervention responses not previously mentioned included adjusting learning spaces, mentioned by five teachers, and adjusting seating, mentioned by four teachers.

Need to Modify Teaching Materials

Question 10 of the pre-intervention survey asked the teachers whether they thought it was important to modify teaching materials for students who have an ASD. Fifteen teachers indicated that they did, two said it depended on the student, and one said she was not sure. A follow-up question asked those teachers who thought it important what modifications they thought were important. Six of the fifteen teachers elaborated on what modifications were important. Three of these six teachers mentioned making the material more visual, two mentioned making the material simpler and more achievable, and one mentioned making more use of the computer.

Question 11(a) of the pre-intervention survey asked the teachers whether they had been able to modify teaching materials for children with ASD in the way they believed was important. Only seven teachers indicated that they had been able to do this. A follow-up question asked for further comment. The two teachers who commented on why they had not been able to do this said that this was due to the availability of time and resources. Question 11(b) of the pre-intervention survey asked the teachers whether they had received any training about how to modify teaching materials. Only two teachers indicated that they had. A follow-up question asked those who had received training to explain more about how they received that training and what it involved. The responses indicated that the training they had received was very minimal.

Question 9(a) of the post-intervention survey asked the teachers whether they had more ideas about how teaching materials can be modified for a student with an ASD after the research project. Seventeen teachers indicated that they did have more ideas about this and one teacher did not answer this question. The

following question in the post-intervention survey asked the teachers what ideas they had gained about modifying teaching materials. Fifteen teachers answered this question. Thirteen mentioned that they had learned about modifying teaching materials so that they were shorter, more explicit, clearer, uncluttered, and with step by step instructions. Six mentioned they had learned about increasing the use of visual aids, such as pictures and symbols in teaching materials. Four mentioned gaining more ideas about using technology. Three mentioned gaining more ideas about using materials the student could physically manipulate. One teacher mentioned realising the importance of capitalising on the student's special interests in teaching materials.

Teachers' Experiences of the Program for Students with Disabilities

Question 12 of the pre-intervention survey asked the teachers to comment on their experience of whether it had made a difference to them in the classroom if a student was supported through the Disabilities an Impairments Program, i.e., the Program for Students with Disabilities. This question was only asked in the pre-intervention survey. Eleven teachers responded that it had made a difference and seven teachers said that they had not had a student in their class who was on the program. All of the teachers who had been supported through the program said it had been helpful and several said that it had made a "huge" difference.

Appropriate School Options for Students with Autism Spectrum Disorders

Question 12 of the pre-intervention survey and Question 10 of the post-intervention survey asked the teachers what they thought are appropriate school options for students who have ASD. The survey gave a number of options and the teachers were able to choose more than one option. The number of teachers who indicated particular options is set out in Table 9.2.

Teachers were also invited to make comments about each option they chose. There were not many additional comments from teachers to this question in pre-intervention or post-intervention responses. However, in both pre-intervention responses and post-intervention responses teachers often commented that the appropriate schooling option depended on the level of disability of the student.

Table 9.2

Numbers of Teachers Before and After Intervention Indicating Specific School Options to be Appropriate for Students with Autism Spectrum Disorders

School Option	Before intervention	After intervention
Mainstream	16	16
Occasional special classes in mainstream	7	10
Special school unit within mainstream	5	10
Special Development School	3	3
Special school for students with ASD	3	3
Some time in mainstream and another venue	1	5
Other	0	0

Note. n = 18

One teacher commented that if a student with an ASD was in a special school unit within mainstream, he or she could still have opportunity to build social skills with mainstream children. Another teacher commented that a student with an ASD might be mainly in mainstream but then, as he or she gets older, it might be of benefit for him or her to receive teaching about life skills in another venue.

Support from Other Teachers and the School Community

Question 14 of the pre-intervention survey asked the teachers whether they had found that other teachers had been helpful in supporting them in working with a student with an ASD. Eleven teachers indicated that they had found other teachers helpful and seven indicated that they had not. A follow-up question asked how other teachers had been helpful if this was the case. Teachers who had found other teachers helpful mentioned the helpfulness of sharing ideas and resources, having other teachers as a sounding board, and being able to debrief with other teachers.

A further pre-intervention survey question in Question 14 (part c) asked what the teacher had found to be most helpful from their school community. Three teachers mentioned having found teacher aides to be very helpful. One

teacher mentioned having found the special needs teacher helpful. One teacher mentioned finding other teacher's encouragement important. One teacher mentioned other teachers' willingness to learn about Autism Spectrum Disorders was encouraging. One teacher mentioned that she had found parents to be very helpful. One teacher mentioned having found the school social worker helpful. One teacher mentioned having found the school psychologist and speech pathologist helpful.

Question 14 of the post-intervention survey was shaped slightly differently to the parallel pre-intervention question. It did not ask if teachers found other teachers helpful but simply asked what sort of support teachers most needed from the school environment when working with students with ASDs. Eight teachers mentioned the need for support from other staff. This support included the need for other staff to understand ways to support the student with an ASD and the need for staff to be supportive of new programs. Two of these eight teachers emphasised the need for the whole school staff to be supportive. Other areas of need were also mentioned. Five teachers mentioned the need for time, whether time to communicate with other staff, time to communicate with parents, or time for making resources. Three teachers also mentioned the need for communication, whether open communication between staff, communication from yard duty teachers, or communication from specialist subject teachers. Three teachers mentioned the need for teacher aide support. Three teachers mentioned the need for more support from specialists. The following needs were each mentioned by one teacher: the need for commitment from the school principal, the need for prior knowledge about the student, the need for professional development, the need for lunchtime support of students through activity programs, and the need for resources (such as the software program Boardmaker).

Communicating and Collaborating with Parents

Question 15 of the pre-intervention survey asked the teachers whether they were willing to see parents of a child with an ASD if they requested to see them. All of the teachers indicated that they were. The teachers were invited to comment and six of the teachers made comments. Two commented that they were willing to

see parents as a matter of policy. Two commented that they saw the parent-teacher relationship as a "partnership" or "team". Two commented that they were willing to tell the parent what they knew or had seen. One teacher commented that she was willing to hear what the parent experienced at home.

Question 11 of the post-intervention survey was worded slightly differently. It asked the teachers whether it had been of benefit to have had more contact with the child's parent through the project. All of the teachers indicated that it had been. The teachers were invited to comment and fourteen teachers made comments. Six teachers commented that they had a better understanding of the student at home and four teachers commented that the parent had a better understanding of the student at school. Five teachers mentioned the benefits of more consistency between home and school. Five teachers mentioned that they realised more fully the benefit of working with the parent. For example, one teacher wrote,

> *My student's mother seems to be more relaxed and participates openly in discussions now.*

Two teachers mentioned the benefits of solving problems together. For example, one teacher wrote,

> *Excellent benefits when parents and teachers work together. Many problems are solved and less stress.*

Question 16 of the pre-intervention survey asked the teachers how important they thought it was that parents of a child with an ASD had involvement with the child's teacher/s so that they could work together. The teachers were asked to indicate whether or not it was "not important", "occasionally important", "often important", or "vitally important". Question 12 of the post-intervention survey asked the same question. For each level of importance, the number of teachers who indicated this level is set out in Table 9.3.

Teachers were also asked why they responded as they did to the question about the importance of teacher's involvement with parents (Question 16b in the pre-intervention survey and Question 12b in the post-intervention survey). In the pre-intervention survey, fourteen of the eighteen teachers gave an explanation. Five teachers mentioned the importance of consistency, and five mentioned the

Table 9.3

*Numbers of Teachers Before and After Intervention Making Specific Judgements
about the Importance of Parents' Involvement with Teachers*

Judgement of importance	Before intervention	After intervention
Vitally important	15	18
Often important	2	0
Occasionally important	1	0
Not important	0	0

Note. n = 18

importance of working as a team. Three responses mentioned the importance of
gaining parental knowledge of their child. One teacher explained that they thought
it was only "often important" to work with parents of a student with an ASD
because it was important to work with other parents of children in the class as
well. In the post-intervention survey (Question 12b), seventeen teachers gave an
explanation of why they thought it was "vitally important" to work with parents.
Four teachers mentioned the importance of consistency, and six teachers
mentioned the importance of working as a team. Seven teachers mentioned the
importance of gaining parental knowledge of their child. In general, in post-
intervention responses to this question, teachers' responses were more elaborate
and included stronger words more often. For example teachers wrote,

> *Consistency is the key.*
>
> *Two-way communication is so vital.*
>
> *For my student it was vitally important that the parent communicate about
> mood states affecting my student at school.*
>
> *It's important to know how a child reacts at home and if triggers come
> from school. Help can be two ways (better for school and better for home).*

Question 17 of the pre-intervention survey asked the teachers in what
areas they thought parents and teachers could collaborate, and Question 13 of the
post-intervention survey asked the same question. In the pre-intervention survey,
fourteen teachers responded. Seven responses related to collaboration in relation

to behaviour management of the student with an ASD, and four responses related to collaboration in relation to learning. Three teachers thought that there could be collaboration in all areas. In the post-intervention survey, eighteen teachers responded. Teachers' responses in the post-intervention survey frequently covered more than one area of possible collaboration. It was mentioned in twelve responses that there could be collaboration in relation to behaviour management of the student and eleven responses mentioned collaboration in response to supporting student learning. Three teachers thought that there could be collaboration in all areas.

Additional Comments

Question 18 in the pre-intervention survey and Question 15 in the post-intervention survey invited the teachers to make additional comments. In the pre-intervention survey two teachers made comments in relation to looking forward to receiving the support through the project. In the post-intervention responses eight teachers made additional comments. One teacher mentioned the need for the criteria for eligibility for funding through the Program for Students' with Disabilities to broaden so that "many children sitting on the borderline can get the help they deserve". The other seven comments were all in relation to the support received. Teachers were very grateful for having received the support and expressed that they had found the experience worthwhile. One teacher specifically mentioned the helpfulness of the resources provided, and one teacher mentioned the benefit of working together in relation to one child. Another teacher mentioned the benefit of being able to work together to prepare her student for having their first successful experience on a camp. Some examples of teacher's comments were,

> *It has been a very worthwhile exercise working together this semester.*
> *I have thoroughly enjoyed being part of this process and have benefited from the resources provided.*
> *This has been a fantastic experience. The follow-through was excellent and all the discussion terrific. It was a great resource.*

Parents' Responses to Surveys Before and After the Intervention

All of the parents involved in the intervention (18 parents) completed Parent Survey 1 (Appendix H) before the intervention period and Parent Survey 2 (Appendix I) after the intervention period.

Specific Diagnoses Given to Their Children

In Table 9.4 parental responses to a number of pre-intervention survey questions are collated. The table relates to Question 1(a), 2 (a), 2 (b), and 3. Question 1(a) asked the parent what specific diagnosis their child had been given by the professional who had diagnosed their child. Parents were given the following diagnoses to choose from: Autistic Disorder, Pervasive Developmental Disorder, Asperger's Disorder/Syndrome, High Functioning Autism, Pervasive Developmental Disorder Not Otherwise Specified, and Other. If they indicated "Other", they were asked to name the diagnosis. Question 2(a) of the pre-intervention survey asked the parent whether their child had been given previous diagnoses before receiving the diagnosis reported in response to Question 1(a). Question 2(b) asked the parent whether their child had received any other diagnoses in addition to an ASD since the diagnosis, and Question 3 asked the parent what they believed was the current full accurate diagnosis of their child. There were a few discrepancies between the diagnosis given to parents, parents understanding of the correct diagnosis and the diagnostic category allocated by the writer according to Lorna Wing's algorithms in the DISCO (Wing, 1994). Details of the diagnoses given to parents, parent's belief about the correct diagnosis, and the diagnosis given in the current research are set out in Table 9.4.

Age of Their Children When Diagnosed

Question 1(b) of the pre-intervention survey asked the parent at what age they found out about their child's diagnosis. According to the specific diagnosis that parents were given when the child was diagnosed by a professional it was found that the average age of a diagnosis of Autistic Disorder was 5 years and 3 months, and the age of diagnosis of Asperger's Disorder, High Functioning Autism or Autism Spectrum Disorder was 6 years and 1 month. However, if one

Table 9.4

Details of Diagnosis Given to Parents, Parents' Beliefs about Correct Diagnosis, and Diagnosis Given in the Present Research through Application of Algorithms in the DISCO (Wing, 1994)

Subject	Diagnosis *before* autism diagnosis	Specific diagnosis given to parents by professional	Further diagnosis received *after* autism diagnosis	Parent belief about correct diagnosis	Standardised diagnosis given in present research
1	no	ASD	no	Asperger's	Asperger's
2	no	Autistic	no	HFA	Autistic
3	no	Autistic	no	Parent not sure	Autistic
4	no	Asperger's	no	Asperger's	Asperger's
5	no	HFA	no	ASD	ASD-NOS
6	no	Asperger's	ADHD	Asperger's	Asperger's
7	ADHD	Asperger's	no	Asperger's	Asperger's
8	no	Asperger's	SLD	Asperger's	Asperger's
9	no	Autistic	no	Autistic	Autistic
10	no	Autistic	no	Autistic	Autistic
11	no	Autistic	no	Autistic	Autistic
12	ID	HFA	no	ASD	ASD-NOS
13	ID	Autistic	no	Autistic	Autistic
14	no	Asperger's	no	Asperger's	Asperger's
15	no	Asperger's	no	ASD	ASD-NOS
16	ADHD DD	Autistic	no	ASD	ASD-NOS
17	no	Autistic	no	Autistic	Autistic
18	ADHD	Asperger's	no	Asperger's	Asperger's

Note. ADHD = Attention Deficit Hyperactivity Disorder, ASD= Autism Spectrum Disorder, ASD-NOS = Autism Spectrum Disorder Not Otherwise Specified, Asperger's = Asperger's Disorder, Autistic = Autistic Disorder, DD= Developmental Delay, HFA= High Functioning Autism, ID= Intellectual Disability, SLD= Specific Learning Disability

considers the average age of diagnosis according to the standardised diagnosis given according to the algorithms in the DISCO (Wing, 1994) the children with Autistic Disorder were diagnosed on average at 4 years and 7 months, the children with Asperger's Disorder were diagnosed on average at 6 years and 6 months, and the children with ASD-NOS were diagnosed on average at 7 years and 7 months.

Importance of Diagnosis When Attending Mainstream Schools

Question 5(a) of the pre-intervention survey asked the parent whether their child had a diagnosis of an ASD throughout all of their schooling. Eight parents indicated that their child had a diagnosis throughout all of their schooling (and ten parents indicated that their child had not received a diagnosis by the start of their schooling).

Question 5(b) of the pre-intervention survey asked the parent whether they thought that it was important for the school to have accurate information about their child's diagnosis. Seventeen of the eighteen parents indicated that they thought it was. A follow-up question asked them to explain why they thought what they did. All of the responses given explained that the school and teachers would be able to understand their child better and not think that their child was simply being naughty when they were having difficulty at school. Two parents added that it was also necessary or even more important that teachers know educational strategies or have resources that may be helpful. The parent who did not think that it was important for the school to have knowledge of the diagnosis added that "only the classroom teacher needs to know [about the diagnosis] on a confidential basis".

Knowledge about Autism Spectrum Disorders

Question 4 of the pre-intervention survey asked the parent whether they felt that they had enough knowledge about ASDs. Ten parents indicated that they did. A follow-up question, to those parents who indicated that they did not feel they had enough knowledge about ASDs, asked what additional knowledge they would like to have. Two parents wanted more knowledge about managing behavioural problems. One parent wanted more knowledge about help with literacy skills, sibling rivalry, bed-wetting, night terrors, and dressing problems. One parent wanted more knowledge about their child's puberty. One parent wanted more knowledge about their child's sensory behaviours (e.g., flapping).

Question 1 in the post-intervention survey asked the parent whether they felt they now had more knowledge about ASDs. Sixteen indicated that they did and two parents who indicated that they did not have more knowledge explained

that they already knew a lot. A follow-up question asked the parents who had indicated that they had more knowledge in what areas they now had more knowledge. Parents were able to indicate a number of areas in which they had gained knowledge. Nine parents responded that they had more knowledge of the reasons behind behaviours, whether these were that the child did not understand, that the child was fearful or frustrated, or some other reasons. Eight parents reported that they had more knowledge of what to do to support their child. Three parents reported that they had more knowledge of their child's particular difficulties, whether sensory or social. Two parents reported that they had more knowledge of their child's strengths or abilities. One parent mentioned that they had more knowledge of how Autism Spectrum Disorders presents differently in different children.

A further follow-up question asked the parent in what areas they felt they still needed to have more knowledge. Three parents mentioned needing to know more about what to do for their child in certain circumstances (for example, when the child had fears or obsessions). Three parents mentioned needing more knowledge about issues relating to how their child would be able to function later in life. Two parents wanted more knowledge about helping their child during puberty, and one parent wanted more knowledge about how to keep being an advocate for their child.

Positive Aspects of Their Children's School Experience

Question 6 of the pre-intervention survey asked the parent what had been positive for their child in their current school experience up until the present time. Eleven parents reported that contact with various members of school staff had been positive, whether by being kind and caring, by having a good attitude, by communicating well, or in some other way. Other areas of importance mentioned included that three parents reported that their child's relationships with at least some other children had been positive. One parent was very encouraged that their child's language had developed so well since beginning school, and one parent was encouraged that their child's literacy ability had developed well. Two parents did not respond to this question.

Question 2 of the post-intervention survey asked the parent what positive things had occurred for their child at school since the project began. All of the parents responded. Eleven parents responded that the teacher now had greater understanding of their child. The ways in which this had been positive varied. To some parents who reported that the teacher had greater understanding, this meant that the teacher was more positive towards their child, whether they were more patient with the child, more accepting of the child's needs, better at picking up stress signals from the child and not applying so much pressure, or more positive in some other way. To other parents who reported that the teacher had greater understanding of their child, this meant that their child was more positive towards school, whether through being more receptive to the teacher or more positive in some other way. Three parents responded that their child was much happier to go to school. One parent wrote, "My child is much more comfortable about going to school now. At home he is much more relaxed about school and he goes expecting to have a good day." Two parents responded that their child's communication skills had developed. Other positive things each mentioned by one parent were that their child's stress was reduced, specific learning tools had been put in place for their child, more help was given in relation to their child's learning difficulties, and their child was making progress with writing skills. One parent also mentioned that it was positive that the teacher now understood that their child had difficulty asking for help, and another parent was positive about the preventative strategies that had been put in place for their child in relation to bullying. In addition, one parent felt positive in relation to the plans put in place to support their child's change to another campus when the child went up to Grade 5 the following year.

Difficulties Their Children Experience at School

Question 7 of the pre-intervention survey asked the parents what difficulties their child had experienced at school. Seventeen of the eighteen parents said that their child had experienced difficulties at school. The responses covered a range of areas and some parents mentioned more than one area of difficulty. Ten parents responded that their child had difficulty with learning and

academic tasks, whether he or she had difficulty understanding what was required of him or her, whether he or she disliked class work and especially writing tasks, or whether he or she had difficulty in some other way. Seven parents mentioned that their child had social difficulties, whether he or she was teased and/or bullied, whether he or she had no friends and was not invited to other children's homes, whether he or she behaved inappropriately toward other children (e.g., by disturbing others in class or being aggressive), or whether he or she had some other social difficulty. Two parents mentioned that their child had difficulty with concentration. One parent said that her child had difficulty listening. One parent mentioned that her child had difficulty asking for help. One parent said that her child had difficulty with school assemblies.

Question 3 of the post-intervention survey asked the parents whether their child had any ongoing difficulties at school. Seventeen parents responded that their child did have ongoing difficulties at school and four parents also expressed their response in terms of their worry about their child. Eleven parents responded that their child had ongoing difficulties with school work, whether difficulties with literacy tasks, difficulties in less structured specialist classes, or other difficulties. One of these eleven parents was afraid that her child's difficulty with learning was getting bigger. Nine parents mentioned that their child had ongoing social difficulties, whether difficulty with being bullied, difficulty working in groups, or other difficulties. Two parents mentioned that their child had difficulty with concentration. One parent mentioned that her child had difficulty asking for help.

Support through the Program for Students with Disabilities

Question 8(a) of the pre-intervention survey asked the parents whether their child was eligible for additional support through the Disabilities and Impairments Program, i.e. the Program for Students with Disabilities. Six parents indicated that their child was eligible. As noted in a previous chapter, five of these children had Autistic Disorder and one had Asperger's Disorder. Question 8(b) of the pre-intervention survey asked the parents to describe the support that their child received at school. The parents of the five children with Autistic Disorder

who received funding through the Program for Students with Disabilities reported that their children received teacher aide support. However, the parent of the child with Asperger's Disorder who received funding through the Program for Students with Disabilities said that her child did not receive teacher aide support. Four parents whose children were not eligible for funding reported that there was some support for their child – in three cases, some teacher aide support, and in one case, support through a life skills program and occupational therapy support. Two of these children who received some support, even though they were not eligible for funding, had Autistic Disorder and two had ASD-NOS. The parents of the other eight children reported that their child received the same support as every other child, except for one parent who said her child got a little bit of extra maths help.

Parental Contact with Schools

Question 9 of the pre-intervention survey asked the parents whether they had ever wanted to come to the school to see the principal, special needs support teacher, or the classroom teacher in relation to their child's needs. Seven parents indicated that they had wanted to see the school principal, nine indicated that they had wanted to see the teacher responsible for special needs support, and sixteen indicated that they had wanted to see the classroom teacher. (Three of the nine schools in the research sample had a designated special needs support teacher and in the other schools the Principal or Assistant Principal had 'special needs support' added to their other roles.) An open-ended follow-up question asked the parents whether the school had made it easy for them to approach school staff. Fourteen parents indicated that the school had made this easy for them and three indicated that the school had not made this easy. One parent did not answer the question but commented that she did not like to bother the teachers.

Question 11 of the pre-intervention survey asked the parents if they felt they had enough involvement with their child's classroom teacher and other teachers who directly worked with their child. With regard to the classroom teacher, eleven indicated that they felt they did have enough involvement and seven indicated that they did not feel they did. With regard to other teachers, eight indicated that they felt they did have enough involvement, six indicated that they

did not feel they did, two did not respond, and two were in a very small school with no additional teachers. There were two open-ended follow-up questions. One question asked the parents what had contributed to the way they felt about involvement with teachers who directly worked with their child. The other question asked the parents to describe the nature of the involvement they had with the classroom teacher and other teachers who worked with their child. How the parents answered these questions varied greatly. On the one hand, the parents who had indicated having enough involvement mentioned ease of access to the teacher and an open, approachable relationship. Some of these parents mentioned chatting briefly to the classroom teacher every day. On the other hand, those who had indicated not having enough involvement mentioned a lack of communication. For example,

> *There has not been enough talking to me about anything.*
>
> *It has been difficult because I have felt that it was thought my child's problems were all due to me. I felt afraid of approaching the school.*

One parent made a distinction between communication and involvement.

> *Although I have had some communication, I feel that this is different to involvement. I have had no involvement. It would be nice if parental involvement was a common practice and not something that needed to be requested.*

Question 4 of the post-intervention survey asked the parents whether it had been of benefit to have had greater access to their child's classroom teacher and others involved with their child through the project. All of the parents indicated that it had. Parents were also invited to comment further. The parent who did not want to bother the teachers reported benefit in seeing the teacher more. Some parents reported a change in relationship with the teacher. For example,

> *I feel I know the classroom teacher better now. I used to feel intimidated by the teacher.*

Some parents reported benefit in knowing what was happening with their child and appreciated being communicated with. For example,

> *There has been more communication happening and I have been more in the loop.*

> *As my child does not communicate to me anything about school it has been good to get feedback about his difficulties and his strengths. It has been good to see the teacher and teacher aide involved and working toward strategies that they will also share with other staff to help manage his anxieties. It has also been good for me to have input into that process.*

Some parents reported that because they knew more about what was being done, they were more able to do the same at home. For example,

> *Because I am now updated on specific strategies used to help I can reinforce these at home.*

> *By working more closely with his classroom teacher there is now a more consistent approach between how things are managed at home and school. This is very important for the child.*

Some parents were well aware that if they had more time to communicate with teachers, this would have benefits for their child. For example,

> *There has been time to talk about what's happening at school that needs to be worked on, like him being upset about not enough tissues, and upset about the black leads missing, and the swapping that was causing a problem. All of these things may seem little but they were big problems to him that were leading to school refusal.*

> *I always felt that teachers were accessible but I have also felt that they didn't really hear what I said. I now feel this has changed. I was not just another parent expecting the world for my child because a professional said what I had been saying.*

> *I feel the teacher has now started to think about [my child's] needs rather than simply focussing on behavioural outcomes.*

Another parent reported the benefit of regular teacher contact in terms of follow-up. She wrote,

> *[Regular contact and ongoing input] has ensured that services have been accessed and followed up.*

> Question 6 of the post-intervention survey asked the parents how they had felt about their involvement with their child's classroom teacher (and other teachers involved with their child) since the project began and then asked why

they thought they felt this way. All parents reported that they had felt very positive about their involvement, although one parent mentioned that it had been hard to get change because the teacher did not understand her child's needs. Five parents mentioned that the parent-teacher relationship had improved and that they no longer felt "fobbed off" or "like a lunatic parent". Five mentioned that it had been good to know more about what was happening. For one of these parents the involvement meant a great reduction in her own anxiety. She wrote,

> *It has made me feel a lot more comfortable about my child being at school. It puts me at ease to know he is happy and if he is not they will ring me. I now don't stress about him all the time. I know they are capable of dealing with him themselves.*

Two parents mentioned that it had been good to help the teacher and to do things together. One parent mentioned that the teacher understood her child better now.

Importance of Parental Contact with Children's Classroom Teachers

Question 10 of the pre-intervention survey asked the parents how important they thought it was that parents of a child with ASD have involvement with the child's teacher/s so that they can work together. Parents rated whether they thought involvement was "not important", "occasionally important", "often important", or "vitally important". Question 5 of the post-intervention survey asked the same question. For each level of importance, the number of parents who indicated this level is set out in Table 9.5.

Table 9.5

Numbers of Parents Before and After Intervention Making Specific Judgements about Importance of Parents' Involvement with Teachers

Judgement of importance	Before intervention	After intervention
Vitally important	16	17
Often important	0	0
Occasionally important	2	1
Not important	0	0

Note. n =18

Open-ended follow-up questions in the surveys before and after the intervention asked the parents to say why they gave the answer they did. The parents who had indicated that they thought that their involvement with their child's teacher was vitally important gave reasons which elucidated their response to other questions about their involvement with their child's teacher. Twelve parents responded that the teacher needs to know what the parent knows about their child. Nine parents responded that the parent needs to know what is happening at school. Six parents responded that if they and the child's teacher worked together, there was more consistency between home and school.

Need for Further Support

Question 12 of the pre-intervention survey asked the parents whether there were any ways in which they would like their child to be supported further at the school. Eleven parents indicated that there were, five indicated that there were not, and two responded that they were not sure. The five parents who indicated that support for their child at school was adequate all had children who were funded through the Program for Students with Disabilities. A follow-up question asked the parents to describe the ways in which they would like their child to be supported further. The parents' responses to this question fell into various categories. Five parents mentioned one-on-one support or aide support for their child. Four parents mentioned more support in the playground. Three parents mentioned greater staff knowledge. Three parents mentioned support for their child in a particular area, whether social skills, literacy, or self-confidence. One parent listed a number of strategies which might be used to support her child, such as the teacher adapting academic expectations and avoiding a confrontational approach to her child, and providing a quiet space in which her child could relax.

Question 7 of the post-intervention survey asked the parents what sort of ongoing support structures they would like to see at school, and there were three parts to this question. The first part asked the parents what sort of support structures they would like to see in place for their child. Eight parents responded that they wanted ongoing regular meetings. Five parents mentioned that they wanted funding and aide support. Three parents mentioned wanting ongoing

occupational therapy support. Three parents mentioned ongoing support in the playground. Two parents said that they wanted ongoing understanding of their child. The second part of the question asked the parents what sort of support structures they would like to see in place for the teacher. Seven parents mentioned continued education about ASDs and professional development. Two parents mentioned helping teachers learn more about specific programs that can help with specific learning difficulties, as well as teachers learning more about what technological supports are available. The third part of the question asked the parents what sort of support structures they would like to see in place for themselves. Fifteen parents mentioned ongoing communication, whether the teacher's communication with them, their communication with the teacher, or both. Three of these parents wanted ongoing regular meetings.

Appropriate School Options for Students with Autism Spectrum Disorders

Question 13 of the pre-intervention survey and Question 8 of the post-intervention survey asked the parents what they thought were appropriate school options for their child. The survey gave a number of options and the parents were able to choose more than one option. If they chose the option of some time in mainstream and another venue, they were asked to specify the mixture. If they chose "other", they were asked to specify what other. The number of parents who indicated particular options is set out in Table 9.6.

Parents were invited to make comments about each option they chose, but there were not many additional comments from parents to this question. In post-intervention responses many parents who chose "mainstream" added "with ongoing support". One parent commented that in the pre-intervention survey she had chosen 50/50 mainstream and another venue but she had come to realise that the Special Development School would be a better option for her child's secondary schooling. One parent added,

> *Ideally I would like a school for children with Autism Spectrum Disorders but I realise this is 'fairyland' in a rural area.*

Table 9.6

Numbers of Parents Before and After Intervention Indicating Specific School Options to be Appropriate for their Child

School Option	Before intervention	After intervention
Mainstream	18	15
Occasional special classes in mainstream	5	9
Special school unit within mainstream	0	0
Special Development School	0	1
Special school for students with ASD	1	3
Some time in mainstream and another venue	1[a]	1
Other	0	0

[a]50/50 mixture

Additional Comments

Question 14 of the pre-intervention survey and Question 9 of the post-intervention survey invited the parents to make additional comments if they wished. In the pre-intervention survey one parent commented,

Surely information gained last year could have been passed on to the next year's teacher. I would think it could be beneficial for the teachers to sit down together at the start of the year and share this information. Or are families destined to impart the same information every year?

In the post-intervention survey five parents made additional comments. All of them were positive comments.

I have received a lot of information and help in the last four months. Everyone's willingness to help has been very good.

Being part of the project has been a great experience. It has been great to learn myself but really great that the teacher was willing to participate.

Communication is SO much better now.

This whole process has been wonderful in helping to get the school to understand that although my child is unfunded he still needs special consideration. His class teacher seems to have changed some of her

expectations of him and other teachers are now dealing with him better and seem to understand more how difficult life is for him in the playground.

I believe that the intervention offered by the project redirected the course of the year for my child. Things were not progressing well and mostly negative attitudes were held by all. Now with greater awareness, effort and understanding a more tolerant and accepting approach is employed.

CHAPTER 10

DISCUSSION

The primary aim of the present research was to evaluate the effectiveness of the implementation of the research model on students with an ASD, as well as the benefits for teachers and parents of participation in the research model.

The secondary aim of the research was to provide more evidence regarding the profile of students with an ASD. This evidence was provided by analysis of the results of a range of assessments of each student in the sample. These assessments were undertaken to gain a more comprehensive understanding of the student's functioning in a number of areas that were of relevance in supporting the inclusion of the student in the school. Included in the secondary aim of the research was evidence regarding the profiles of the students in each of the diagnostic categories, namely, Autistic Disorder, Asperger's Disorder, and ASD-NOS.

The effects of the implementation of the research model on students with an ASD and possible explanations for these effects are discussed in the first part of this chapter. Consideration is also given to the factors that may have contributed to these effects. In the second part of this chapter the evidence provided by the assessments regarding the profile of students with an ASD is discussed. In the third part of the chapter the effects of the implementation of the research model on the teachers and parents of students with an ASD are discussed. Consideration is also given to the factors that may have contributed to these effects. The final part of the chapter considers limitations of the research, areas for further research, and key recommendations arising from the research.

The Behavioural Effects of the Model on Students with an Autism Spectrum Disorder

The Effect on Students' Autistic Behaviours

    The results of the present research

The effectiveness of the research model in relation to its effects on the autistic behaviours of students with an ASD was evaluated experimentally. These

autistic behaviours are behaviours which may increase or decrease in severity or frequency but which continue to be present to some degree. For example, in relation to self-care tasks, a child with an ASD may resist using a toilet or may be unwilling to dress him- or herself. In relation to communication, a child with an ASD may not share information or feelings about events that have happened throughout the day. In relation to social interaction, a child with an ASD may not greet other students. However, these are all behaviours that can be supported, for example, through use of a visual depiction of how to do a task (Hodgdon, 1995, 1999; Quill, 1997), and so are behaviours that can be taught and encouraged. Also, in relation to repetitive and stereotyped movements, responses to sensory stimuli, resistance to change, and emotional responses, it may be possible to ameliorate some of these behaviours through recognition of the atypical effects of commonly occurring sensory inputs on a student with an ASD (Huebner, 2001; Williams & Shellenberger, 1996).

It was hypothesised that students with an ASD who participated in the implementation of the research model would demonstrate a greater decrease in autistic behaviours than students with an ASD who did not participate in the implementation of the research model. This hypothesis was supported by the experimental results which showed a significant overall decrease in autistic behaviours and a greater decrease in most kinds of autistic behaviours. This was found for both groups of students when they were the focus of the implemented model. In particular, there were improvements in self-care skills, communication ability, social interactions, and a decrease in repetitive and stereotyped activities. It was also found that the implementation of the research model was equally effective for the students in each autistic diagnostic category. These improvements in autistic behaviours did not mean that there were no longer any difficulties for the student. Rather, what was indicated was a greater decrease in the severity of a range of autistic behaviours within the context of the implemented model than within the context of the regular support that was in place for the student.

Previous research supportive of the present results

Before the present research there had been little research in relation to comprehensive educational programs with an emphasis on structured teaching. There had been even less research that attempted to control for change that would have occurred over time regardless of the intervention. However, in relation to the available research, the present research results are supportive of the findings by Ikeda et al. (2002). They carried out testing before and after a program of teacher training and ongoing teacher support that included structured teaching practices. They found that there was a significant decrease in total autistic behaviours, sensory motor behaviours, sensory responses, communication concerns, and an improvement in social interaction skills. In the present research decreases in similar areas of autistic behaviours were found. The repetitive and stereotyped behaviours measured in the present research included sensory motor behaviours and sensory responses as measured by Ikeda et al. The main differences between the present research results and the results of Ikeda et al. is that Ikeda et al. only used pre and post measures. They also did not find a significant improvement in self-care behaviours. It is of interest that the model reported by Ikeda et al. did not include active participation of parents. It is possible that parental participation was an important factor in the significant improvement in self-care behaviours that was found in the present research.

Reasons for the effectiveness of the research model

The hypothesis that the implementation of the research model would be effective in decreasing the autistic behaviours of students with an ASD was based on certain principles of good practice. Reviews of early intervention programs that had been effective had reached some consensus in terms of common elements of good intervention practices (Dawson & Osterling, 1997; Iovannone et al., 2003). These elements included individualised supports in terms of structuring the learning environment and curriculum, supporting positive behavioural change by first of all examining behaviour and understanding that there is a reason for all behaviour, and parental involvement (Iovannone et al., 2003). The soundness of these elements of intervention practice has recently been supported through

further review (Roberts & Prior, 2006). It was these core principles that Kunce (2003) outlined in her systematic model and that Simpson et al. (2003) built upon.

The model implemented in the present research was also based on these principles with collaboration as the means by which these principles were implemented. Collaborative practice was implemented through the planning and support groups which involved teachers, parents, and the autism consultant. Within these groups, teachers and parents learned about possible interventions for students with an ASD but they also worked collaboratively on meeting the individual needs of one student.

The assessment results for the student across various functional areas (i.e. academic needs, executive functioning difficulties, sensory differences, social and behavioural problem areas) were considered. Teachers and parents then decided together on which of their concerns for the student should have priority. Then, assuming that there was a reason for all behavioural difficulties that the student exhibited, the planning and support group worked together in thinking about all the possible reasons that might be contributing to this difficulty. For example: Did the student understand the instruction adequately? Was the student experiencing possible sensory difficulties? Was there distress through social difficulties? Were there learning difficulties, or organisational/planning difficulties to support?

It was then possible to design structural supports for the student to help him or her to participate in the classroom or playground. Built into the structural supports were strategies that often prevented the student from experiencing an escalation of stress. The planning and support group also thought about further support through the curriculum with an emphasis on structural support prior to curricular content. Understanding the assessment results provided a good basis for working on supportive interventions.

These interventions were then implemented one at a time. As well as being involved in generating intervention suggestions, the planning and support group helped in the actual implementation of what was planned. Progress in the implementation of interventions was evaluated at the next fortnightly group meeting. This was a different process to what often happens in Student Support Groups in which a number of goals are set and follow-through in relation to these

goals can vary. There may be a lack of ongoing support for the teacher or there may be long periods of time between meetings of the Student Support Group. These problems were overcome in the model that was implemented in the present research.

The present research has experimentally supported the effectiveness of a model based on recognised principles of good practice and collaboration. It therefore provides important empirical data to add to the current research knowledge about students with an ASD and how they may be best supported in a mainstream educational setting.

The Effect on Students' Executive Functioning

The effects of the implementation of the research model on the executive functioning of students with an ASD were also measured. When the executive functioning of the students in the sample was measured before their participation in the implementation of the research model, it was found that 83% of the sample had overall difficulties in executive functioning to a clinically significant level. It was also found that 78% of the sample had difficulties to a clinically significant level in their ability to cognitively self-manage tasks which included their ability to initiate, to problem solve in working memory, their ability to plan, their ability to organise, and their ability to monitor tasks. It was also found that 61% of students in the sample had difficulty to a clinically significant level in their ability to regulate their behaviours which included their ability to inhibit, shift focus, and to have emotional control. The data emphasises that a high percentage of students had very high levels of executive functioning difficulty in some areas and supports other research that has found that individuals with an ASD often have executive functioning deficits (Frith, 2003; Ozonoff, 1997; Ozonoff et al., 1991; Ozonoff et al., 1994).

It was hypothesised that students with an ASD who participated in the implementation of the research model would demonstrate improvement in executive functioning. However, there was no change in executive functioning either for the total sample of students with an ASD or for students in any autistic diagnostic category.

The interventions that were put in place were based on knowledge about the sort of structural supports necessary to support common executive functioning deficits (Ozonoff, 1998), but there was no known evidence on which to base the hypothesis that these structural supports would remediate the problem. One possibility is that the period of time during which the research model was implemented was too short for change to be evident. Rees (2005) has stated that people with executive functioning deficits through injury need to be externally supported with "significant sustained personal support [and] cueing" (p.187). Rees also believes that this compensation will need to be sustained until a behaviour becomes a "habitual behaviour" (p.175). If this is so an individual with executive functioning deficits will require considerable ongoing support as standard practice for some time.

An educational implication of this is that it is likely that students with an ASD may require classroom support in a range of areas of executive functioning for an ongoing period of time. Indeed it is probable that students may require ongoing executive functioning support as suggested by Ozonoff (1998) throughout all of their school years (and possibly even beyond).

The high percentages of students with an ASD who had executive functioning difficulty to a clinically significant level in various areas strongly suggested that providing structures to support the executive functioning skills of students with an ASD will be necessary if the student is to have a chance of succeeding in the classroom. Teachers need to expect that they may well have to help a student with an ASD in some aspects of executive functioning. Some students may need to be supported in approaching and self-managing any given work task, and others may need to be helped with behavioural regulation, particularly when they are required to shift task or focus. Many classrooms require students to participate in group work, and to perform open ended exploratory tasks, however, students with an ASD will need clear structuring to be able to participate in group work or exploratory tasks. Ozonoff (1998) suggests that executive functioning may be supported through visual planners, fore-warning, helping with tasks involving starting, stopping and transitioning, and preparing the student for new activities. It is likely that teachers will need

knowledge about these and other interventions to provide supportive scaffolding for students.

The Effect on Students' Problem Behaviours

The effects of the implementation of the research model on the problem behaviours of students with an ASD were also measured. When the problem behaviours of the students were measured before their participation in the implementation of the research model, it was found that, according to teacher report, 44% of the sample had overall problem behaviours in the clinical range and, according to parent report 61% of the sample had overall problem behaviours in the clinical range.

It was hypothesised that students with an ASD who participated in the implementation of the research model would demonstrate a decrease in problem behaviours. This hypothesis was supported by a significant overall decrease in problem behaviours according to both teacher report and parent report.

A number of specific problem behaviours were also indicated to significantly decrease. Both teacher report and parent report indicated a significant decrease in attention problems. This evidence of an improvement in attention may be compared with the finding in Ikeda et al.'s (2002) research that there was an improvement in the *on task* behaviours of students in class.

Both teacher report and parent report also indicated a significant decrease in aggressive problems. However, only teacher report also indicated an overall decrease in externalising problem behaviours (i.e. behavioural problems involving other people), whether these problems were aggressive problems or rule-breaking problems. Given the recognition of the tremendous stress on teachers and parents when students engage in aggressive behaviours (Pratt, 2008) and given reports that a particular concern which teachers have in relation to students with an ASD is the management of aggressive and disruptive problem behaviour (Kidman, 2006), the results in the present research in relation to the decrease in these negative externalising behaviours are very important. The results from both teacher and parent report are encouraging in that they indicate that putting in place

a systematic model of support that is based on good practice principles can make a difference in relation to aggressive behaviours.

Only parent report indicated a decrease in thought problems for their child. This included such things as their child "not being able to get their mind off certain thoughts", or "having trouble sleeping". Other research has suggested that higher functioning students with an ASD can have complex inner lives (Ghaziuddin, Leininger, & Tsai, 1995). The result in the present research indicates that parents may be more aware of the inner thought world of their child than teachers. The decrease in thought problems according to parent report in the present research indicates that the provision of supportive structures for the child in the school environment can decrease problem thoughts.

In relation to differences between the students in each autistic diagnostic category, only one difference was found in the effects of the implementation of the research model on their problem behaviours. This was that problems in relation to being withdrawn or depressed decreased more for students with Autistic Disorder and students with Asperger's Disorder than for students with ASD-NOS. It is difficult to offer any explanation for this, but it is evidence that students with ASD-NOS are a group to not be overlooked who may have some particular problems.

There is no consensus as to whether or not problem behaviours are part of the presentation of an ASD or co-morbid problems. However, at the very least these results indicate that there are a percentage of students with an ASD in primary school who have behavioural problems to a level that places them at risk of the development of further behavioural issues (e.g. a clinical diagnosis of anxiety or depression or a conduct disorder). In order to address these problems it is important that the student's autism is understood so that stresses arising from the educational environment, in terms of social difficulties, sensory difficulties, academic difficulties or other difficulties, that may be driving their behavioural expressions, can begin to be addressed whilst the student is in their primary school years (Gabriels, 2007).

The hypothesis about an improvement in problem behaviours was based on the conceptual model suggested by Bartak et al., (2006) that when there is

increasing environmental stress additional layers of behavioural difficulty may be built upon core primary deficits of autism (Refer to Appendix A for a pictorial representation of the model). In this view secondary consequences are evident in increasing ritualistic behaviours and other attempts or difficulties of an individual with an ASD to control his or her environment. Tertiary consequences are evident in increasing problems which an individual with an ASD has within him- or herself or with other people. Psychiatric problems are evidence of the greatest levels of environmental stress upon a person. According to this conceptual model it is highly important that appropriate interventions to support the reduction of stress for students should be put in place. This is exactly what was done in the implemented model in the present research. The implemented model involved helping teachers and parents to recognise potential environmental stressors for students with an ASD and to plan appropriate supportive interventions. The present research results thus provide evidence that reducing environmental stressors for students with an ASD can help in reducing their problem behaviours in an overall sense and particularly their problems in relation to attending to the environment and their aggressive problems.

The Profile of Students with an Autism Spectrum Disorder

Evidence regarding the profile of students with an ASD and students in each autistic diagnostic category was gained by analysing the results of the assessments of the students who participated in the research model. The results of the assessments of each student provided important information in relation to the needs of that student and this information was used in the planning and support groups. As well, analysis of the results for the students in the total sample and for the students in each autistic diagnostic category is intended to provide valuable profile information for educators in relation to the needs of students with an ASD in mainstream schools.

Intellectual Ability

In relation to intellectual ability, it was found that the perceptual reasoning of students with an ASD was similar to that of other students of the same age. It

was also found that their perceptual reasoning was significantly higher than their verbal comprehension and their processing speed. The difference between perceptual reasoning and verbal comprehension is similar to the findings of Lincoln, Allen, and Kilman (1995).

When differences in intellectual ability between the students in each autistic diagnostic category were analysed, it was found that students with Asperger's Disorder had significantly higher verbal comprehension, processing speed, working memory, and general intelligence than either students with Autistic Disorder or students with ASD-NOS. However, it was not found that there was any significant difference in perceptual reasoning between students in each autistic diagnostic category. There is no consensus on these differences in other research. It is also difficult to compare other research when the samples are based on some differences in diagnostic criteria.

Given this lack of consensus, it is best to determine the particular strengths and weaknesses of the individual student with an ASD. In the regular planning and support group meetings, the autism consultant explained what the intellectual testing results indicated in terms of the student's intellectual ability and possible underlying cognitive deficits (such as difficulty understanding language, auditory processing difficulties, problem solving difficulties, executive functioning difficulties, or attention skills difficulties). Teachers' survey responses after the implementation of the model indicated that some of them had gained greater clarity about the intellectual ability of their student and that some of them had previously been confused about terms such as *High Functioning Autism*. Specific information about the intellectual ability of the student with an ASD was important for teachers because it helped explain the difficulties for the student that were indicated in intellectual assessment results that otherwise may not be readily realised (Reitzel & Szatmari, 2003).

It was also frequently noted by the writer that parents had little understanding of what previous intellectual assessment results had indicated about their child's intellectual ability and they found it helpful to have the results explained to them in a way that was understandable. Having this understanding they were better able to support their child's functioning in the home and wider

community environment. One mother found the explanation that was given about her child's intellectual ability to be of such importance that she arranged for the child's grandparents to come to an additional meeting so that they could gain a better understanding as well.

Academic Ability

The importance of having an understanding of the intellectual ability of a student with an ASD along with an understanding of his or her academic ability has been emphasised by others (Manjiviona, 2003). This is important in order to understand the student's strengths but also to understand the student's specific academic weaknesses. Specific weaknesses in academic functioning will affect the student's ability to have success in the classroom and may well be a source of distress for the student (Manjiviona, 2003).

Reading Accuracy and Reading Comprehension

In relation to reading, both the reading accuracy and reading comprehension of many of the students in the sample were below or very much below average. These results support the suggestions of others that students with an ASD may require additional support in terms of literacy skill acquisition in both reading and/or reading comprehension (Manjiviona, 2003; Prior, 2003b; Reitzel & Szatmari, 2003).

When reading accuracy and reading comprehension were analysed in order to see whether there were differences between the students in each autistic diagnostic category, it was found that students with Asperger's Disorder generally had higher reading accuracy than students with Autistic Disorder. It was also found that students with Asperger's Disorder had higher reading comprehension than either students with Autistic Disorder or students with ASD-NOS. These findings may be compared with the findings in relation to intellectual ability that students with Asperger's Disorder had higher verbal comprehension than either students with Autistic Disorder or students with ASD-NOS. However, reading ability results need to be compared with intellectual ability in order to determine if

a student has a *Specific Learning Disability* that may be impairing their academic functioning.

When actual reading ability was compared with predicted reading ability on the basis of intellectual ability, it was also found that students in each autistic diagnostic category (and across a wide range of intellectual ability) could have a Specific Learning Disability in relation to reading. In the present research it was found that 57% of students with Asperger's Disorder had a Specific Learning Disability in relation to reading. Although there were differences in the tests used, Myles et al. (2002) also found that the independent and silent reading levels of students with Asperger's Disorder were significantly below grade level. It was also found in the present research that 29% of students with Autistic Disorder had a Specific Learning Disability in relation to reading. This percentage is higher than found previously by Mayes and Calhoun (2003). As well, in the present research it was found that 25% of students with ASD-NOS had a Specific Learning Disability in relation to reading.

If a student has a Specific Learning Disability in relation to reading then the student would benefit from reading support to improve their skills and the teacher would need to be mindful of making accommodations in relation to text difficulty in work requirements. It may also mean that the student may disengage easily from any task involving reading so teachers would need to make sure that students could experience success and not get discouraged.

It was of interest though in the present research that students with an ASD were just as likely to have reading ability higher than predicted as to have reading ability lower than predicted. Furthermore, it was found in the present research that students with an ASD with a range of intellectual ability could have higher than predicted reading ability. This result differs from the finding of Mayes and Calhoun (2003) that students with autism who had lower IQ (an IQ below 80) were more likely to have higher than predicted reading ability than students with autism who had higher IQ (an IQ above 80). The present research findings underline the variability in possible presentations for students with an ASD.

The following case from the present research also emphasises the variation in presentation of reading ability that was found. One student with Autistic

Disorder had low average overall intellectual ability, but he had above average reading accuracy, and average reading comprehension. His reading ability was found to be significantly higher than predicted by his low average intelligence. This was an unusual profile, however, it is possible that this student's reading accuracy and reading comprehension ability indicated that he had the potential to continue to develop in relation to language ability as he matured. If this was the case, then he may be an example of a child with Autistic Disorder who later in his development would present more like a typical young person with Asperger's Disorder (Frith, 1991; Wing, 1981; Wing, 1991; Wing, 1998).

Importantly, the profile findings in relation to reading ability indicated the need to find out through thorough assessment the strengths or support needed for an individual student with an ASD.

Written Expression

The written expression ability of most of the students in the sample was very much lower than average. It was also indicated that there was not a significant difference between the written expression ability of students in each autistic diagnostic category.

When actual written expression ability was compared with predicted written expression ability on the basis of intellectual ability, it was found that 72% of the students in the sample had a Specific Learning Disability in relation to written expression. Previous research has also found that written expression is an area of weakness. Mayes and Calhoun (2003) found that 63% of their sample of students with Autistic Disorder (and an IQ above 80) had a Specific Learning Disability in relation to written expression, and that the students with Autistic Disorder in the low IQ group (an IQ below 80) could not complete the written expression task at all.

In the present research it was found that all of the students with Asperger's Disorder, most of the students with ASD-NOS, and about half of the students with Autistic Disorder had a Specific Learning Disability in relation to written expression. The result in relation to the written expression ability of students with Asperger's Disorder differs from that of Griswold et al. (2002) who found that

students with Asperger's Disorder had written expression skills that were within the average range. However, further research by Myles et al. (2003) found that although on aggregated scores students with Asperger's Disorder performed similarly to peers in written expression tasks their written expression was generally brief and not complex. In addition, Myles et al. commented that there was considerable variability in the data and that the aggregate data did not reflect the difficulty that some of the students with Asperger's Disorder had in the written expression task. They suggested that further research needed to be done in this area. The high level of difficulty indicated in written expression tasks in the present data underlines that further research in this area is necessary both in terms of the motor difficulties involved in handwriting and in terms of the intellectual difficulties involved in elaborating thoughts in an organised way.

Importantly, it needs to be noted that students across all of the autistic diagnostic categories could have a Specific Learning Disability in relation to written expression. In the present research it was also evident that students with Asperger's Disorder and ASD-NOS were very likely to have this difficulty. Written expression is therefore highly likely to be an area in which teachers will need to provide additional structural support for students with an ASD. This is important to consider when one also thinks about how many of the typical tasks at school often involve written expression skills.

Mathematical Reasoning

In relation to mathematical reasoning, it was found in the present research that the mathematical reasoning ability of students with an ASD was generally in the low average range. It was also found that students with Asperger's Disorder generally had higher mathematical reasoning ability than students with Autistic Disorder. This finding may be compared with the finding in relation to intellectual ability that students with Asperger's Disorder generally had higher intelligence than students with Autistic Disorder.

When actual mathematical reasoning ability was compared to predicted mathematical reasoning ability on the basis of intelligence, it was found that most of the students in the sample were performing as predicted, including the students

with Asperger's Disorder. This result differs from Reitzel and Szatmari's (2003) finding that almost half (46%) of 9 to 13 year old students with Asperger's Disorder had a Specific Learning Disability in relation to mathematics. This is an upper primary school age range and differs from the present sample age range. It may be that Reitzel and Szatmari's results reflect the difficulty that students with an ASD can have as mathematical concepts increase in complexity as a student progresses through school. However, in general, the present research results are similar to other findings that the mathematical ability of students with an ASD is more likely to be closely associated with intelligence (Corbett, Carmean, & Fein, 2009; Mayes & Calhoun, 2003).

Sensory Processing Difficulties

Sensory processing research studies and reviews have demonstrated that it is common for children with autism to have a marked and unusual pattern of sensory perception and sensory reactions (Dunn, Myles, et al., 2002; Rogers & Ozonoff, 2005). This was suggested in the present research in which assessment of sensory processing found that every student in the sample had a sensory processing difficulty in at least one area of sensory processing that was definitely different to the normal population.

In the present research two-thirds or more of the students in the sample had a sensory processing difficulty in relation to inattention or distractibility, in relation to their emotional responses, and in relation to their ability to meet task performance demands, and more than half of the students had sensory processing difficulty in relation to auditory processing, multi-sensory processing, modulation of sensory input, sensory registration, and a tendency to be sedentary.

There were also marked differences between the students in each autistic diagnostic category in some areas of sensory processing. In particular, all of the students with Asperger's Disorder and all of the students with ASD-NOS, but only one of the students with Autistic Disorder, had difficulty in relation to their emotional/social responses. Dunn, Myles, et al. (2002) also found that a high percentage of students with Asperger's Disorder had difficulties in this and other areas of sensory processing. The results of further research by Myles et al. (2004)

were similar. They found that students with Asperger's Disorder had more difficulty than students with Autistic Disorder in relation to their emotional/social responses. They concluded that the sensory processing patterns of students with Asperger's Disorder and students with Autistic Disorder may be distinct in some ways. One possibility for this difference may be that students with Asperger's Disorder may attempt to engage more with the social environment around them than students with Autistic Disorder but, because they may have difficulty or be unsuccessful at engaging, they may respond in more emotionally volatile ways.

The present research also indicated that half of the students in the sample had both hyper-responsiveness and hypo-responsiveness. This supported previous suggestions that children with autism often have odd and contradictory responses to sensory input (Dunn, Myles, et al., 2002). It is suggested that if a child shows both hyper-responsiveness and hypo-responsiveness, this is evidence of a poor ability to modulate and that when this is the case, a child's responses may vary dramatically from one situation to another (Dunn, 1999; Dunn, Myles, et al., 2002).

The educational implications of the evidence that students with an ASD very commonly have sensory processing difficulties are that these difficulties need to be identified and that it will be helpful if teachers can learn ways in which they can take these sensory difficulties into account in a school setting (e.g. Dunn, Saiter, et al., 2002). This applies to all students with an ASD.

Theory of Mind Ability

In relation to theory of mind ability, it was found that all of the students in the sample had theory of mind deficits. The students with Autistic Disorder were found to have a profound deficit in this ability. No student with Autistic Disorder was able to make a correct choice or correct justification in any of the theory of mind tests including the most basic test. This included one boy in Grade 6 who was nearly 12 years old. Although all of the students with Asperger's Disorder and most of the students with ASD-NOS passed the most basic test, many of these students had difficulty with the more complex theory of mind tests. This finding that students who passed simple tests might have difficulty with more complex

tests was consistent with the research results of Happé (1994a) and Kaland et al. (2002).

With regard to the more complex theory of mind tests, most of the students gave an incorrect answer to the question requiring a mental inference and some students indicated that they could not answer the question. The incorrect answers involved a physical or literal justification and often these justifications were elaborate and unusual and demonstrated how difficult it was for the students to give a mental state explanation. The tendency for many students with an ASD to give an incorrect, literal, or unusual mental state justification was also found by Happé (1994a).

Of the six students from the sample who were old enough to be assessed using the most complex test, only one student with Asperger's Disorder was able to answer correctly the question which required understanding of a mental state. The other students gave incorrect justifications involving a physical reason. The student who gave a correct answer was ten years old and his verbal comprehension ability was indicated to be above average in intellectual testing. However, this student was not able to give a correct answer to the question requiring a mental inference in all of the theory of mind tests, so there was some inconsistency in his ability. This indicates that even when theory of mind ability is evident it can be a fragile ability and may vary according to the task, the student's familiarity with the sort of situation, and how embedded the task is in a real life situation.

In the present research the profound theory of mind deficits of students with Autistic Disorder was very evident. This means that they have a high level of social vulnerability. The educational implication of this is that a high level of social support will need to be put in place for students with Autistic Disorder. However, the students with Asperger's Disorder and ASD-NOS were found to have difficulties with theory of mind tasks as these tasks increased in difficulty. It is possible that students' verbal skills may sometimes mask this difficulty. The educational implication of this is that teachers need to be aware that students with an ASD may have difficulty with theory of mind skills. Teachers need to understand how to take account of these deficits in the classroom and playground

and to be aware of how to provide structural supports to reduce student's vulnerability.

Autistic Behaviours

The students in the sample were diagnosed as having an ASD on the basis of their autistic behaviours and changes in the autistic behaviours of these students during the implementation of the research model were the basis on which the effectiveness of the implementation of the research model was evaluated. With regard to differences between the students in each autistic diagnostic category in relation to autistic behaviours, it was found that there was no overall difference in autistic behaviours or any differences in relation to self-care, communication, social interaction, or repetitive and stereotyped behaviours according to autistic diagnostic category. This means that in terms of these autistic behaviours all of the students with an ASD in this mainstream sample had similar levels of autistic behaviours. This finding is contrary to the claim that certain autistic diagnostic categories are more severe or that Asperger's Disorder is a mild variant of Autistic Disorder.

However, a difference was found between the students according to autistic diagnostic category in relation to maladaptive behaviours, such as temper tantrums and embarrassing remarks in public. It was found that students with Autistic Disorder had less of these behaviours than either students with Asperger's Disorder or students with ASD-NOS. This difference between students with Autistic Disorder and other students with an ASD in this sample may indicate that fewer children with Autistic Disorder with maladaptive behaviours were placed in a mainstream school. This is a possibility as children with an intellectual disability can be placed in a special school and this would therefore have been an option for more of the students diagnosed with Autistic Disorder. Examination of the maladaptive behaviours of a larger range of students with Autistic Disorder would have required assessment of students at local special schools and this was not possible in the scope of the present study. The focus of the present study though was to understand more about the students with an ASD who were likely to attend a mainstream school. The present research therefore

suggests that in this sample from mainstream schools students with Asperger's Disorder and ASD-NOS had significantly more maladaptive behaviours than students with Autistic Disorder.

Executive Functioning

The executive functioning deficits of the students in the sample and changes in their executive functioning during the implementation of the model have already been discussed. With regard to differences between the students in each autistic diagnostic category, no significant differences were found other than that students with ASD-NOS had more difficulty in monitoring their own performance than students with Autistic Disorder. Apart from this, students across all of the diagnostic categories had similar levels of difficulty in executive functioning. Manjiviona and Prior (1999) also found that children diagnosed into various autistic diagnostic categories performed similarly on neurological tests of executive functioning.

Given the results in the present research that students with Asperger's Disorder generally have higher intellectual ability than either students with Autistic Disorder or students with ASD-NOS, intellectual ability does not appear to be a factor in executive functioning deficits. Rees (2005) makes the point that executive functioning deficits can occur across all levels of intellectual ability and even when intellectual skills remain intact. He also points out that executive functioning deficits can lead to major dysfunction in daily life and so one should not think that the effects of executive dysfunction are less when intellectual ability is intact.

The basic educational implication of the general result that all of the diagnostic categories had similar levels of difficulty in executive functioning is that executive functioning difficulties will need to be compensated for across the autism spectrum and across all levels of intellectual ability. This will need to be the case if students are to be able to function adequately in the classroom. This underlines again that students with an ASD are likely to require classroom support in a range of areas of executive functioning as suggested by Ozonoff (1998).

Problem Behaviours

The overall decrease in problem behaviours, and especially attention problems and aggressive behaviour, during the implementation of the research model has already been discussed. However, comparison of teacher and parent responses and analysis of differences according to diagnostic category allows for further understanding of this sample of students with an ASD.

Differences between Teacher and Parent Report of Problem Behaviours

It was found that the attention problems, social problems, aggressive problems, and rule-breaking of the students in the sample were significantly higher according to parent report than according to teacher report. These differences were reflected in the related finding that half or nearly half of the students had problem behaviours which were of clinical concern in each of these areas according to parent report but none or only one of the students had problem behaviours which were of clinical concern in each of these areas according to teacher report.

These findings about problem behaviours according to parent report and teacher report were based on ASEBA-CBCL and ASEBA-TRF scores. These scores are standardised scores, so, for the same students, there should hypothetically be no difference in these scores, even supposing some general difference in the ways parents and teachers report. Therefore, the finding that the students' scores in relation to the kinds of problem behaviours mentioned were generally higher according to parent report than according to teacher report suggests that the students showed these kinds of problem behaviours more to their parents than to their teachers. This could explain anecdotal reports from parents that teachers do not always observe the behaviour that they struggle with at home and that this can lead teachers to be unaware of or sometimes doubt that the behaviour occurs to the severity expressed by parents.

In relation to social problems, the difference between teacher and parent report was also reflected in the survey responses. When teachers were asked about the needs of students with an ASD, social skills development was mentioned by four teachers in pre-intervention responses and two teachers mentioned the need

for students with an ASD to have peer support. In post-intervention responses three teachers again mentioned the need for social skill development and one teacher mentioned the need for peer support. However, in parents' pre-intervention responses, when parents were asked about the difficulties their children had at school, seven parents mentioned social difficulties and in another question four parents mentioned the need for more support in the playground. Parent responses indicated that they wanted active help for their child to support the social difficulties their child experienced, rather than social skill development. In post-intervention responses parents continued to mention the need for active and ongoing social support for their child. Nine parents mentioned the need for ongoing support in relation to their child's social difficulties and in another question about further support four parents mentioned the need for more support n the playground. One parent commented that they were appreciative of what was put in place during the project to help support their child in relation to bullying incidents. However, it was evident in the parents' post-intervention responses that parents continued to be acutely aware of their child's social problems and they often continued to have concerns about their child in the playground and in relation to bullying. Both the ASEBA-CBCL (parent report) results and the parent survey responses suggested that parents had a higher level of concern in relation to their child's social problems than teachers, even though teachers had some level of social concern for the students with an ASD.

Reasons for the attention problems, aggressive problems, rule-breaking, and social problems of the students being generally higher according to parent report than according to teacher report can only be suggested. One possibility is that the structure of life at school prevents or discourages a student with an ASD from demonstrating these kinds of problem behaviours as often at school as they display them at home. Another possibility is that the stresses of the day can sometimes be *held in* or controlled by the student at school but they are not controlled at home. It is possible that this overflow of stress is more often demonstrated behaviourally at home. In relation to social problems, it may also be that parental awareness of social difficulty arises from parents witnessing more

behavioural signs of distress after school and that parents believe that this distress is at least partially due to the social stresses that their child experiences at school.

If students are demonstrating an overflow of the stresses of the day at home, then it is important that possible stressors during the school day are ameliorated or lessened if possible. The writer believes that this underlines the importance of home-school communication. To the extent that students with an ASD do not show their problem behaviours to their teachers, their teachers need to hear about these problems from their parents. Home-school communication can be supportive in terms of the teacher being aware of the need for making appropriate modifications in the school environment so that stresses in the day do not overflow later in the day in the home. Given that parents may be the best source of evidence of the difficulties that the students are experiencing, it is important that teachers have an opportunity through communication with parents of knowing about potential stressors for students with an ASD so that ways of alleviating stress and a possible escalation of psychopathology can be worked upon at school as well as at home.

Differences in Problem Behaviours according to Autistic Diagnostic Category

Differences between the students in each autistic diagnostic category in relation to problem behaviours were also analysed. According to teacher report, there were no significant differences. However, according to parent report, there were a number of significant differences.

It was found that, according to parent report, the students with Asperger's Disorder generally had more overall problem behaviours than the students with Autistic Disorder. In particular, they generally had more problems within themselves, particularly in being anxious or depressed and in having somatic complaints (e.g. stomach aches). They also generally had more problems with others, both in rule-breaking and in being aggressive, and they generally had more social problems and thought problems. These results are similar to those of Tonge et al. (1999), who reported that children and adolescents with Asperger's Disorder presented with higher levels of psychopathology than students with high

functioning autism especially in terms of disruptive and anti- social behaviours and anxiety.

It was also found that, according to parent report, the students with ASD-NOS generally had more overall problem behaviours than the students with Autistic Disorder. In particular, they generally had more problems with others, both in rule-breaking and in being aggressive, and they generally had more somatic complaints, more social problems, and more attention problems than students with Autistic Disorder. Also, according to parent report, the students with ASD-NOS generally had more attention problems than the students with Asperger's Disorder. Therefore, this group of students classified as having ASD-NOS also needs to be considered as having high levels of psychopathology.

Provision of Support through Student Support Groups

The data concerning the students in the sample have indicated in many ways that all students with an ASD in a mainstream educational setting have a high level of need for educational and behavioural support. On this basis, it might be argued that all students with an ASD have a need for additional support and at the very least require a Student Support Group structure that can focus on their particular support needs. Therefore, it was concerning to find that seven (39%) of the eighteen students in the sample had no additional structure of support in place at their school at the start of the present research although they had been diagnosed as having an ASD. For those students who were deemed eligible for the Program for Students with Disabilities, it was required that a Student Support Group be put in place. However, for those students who were not eligible for this program, a diagnosis of having an ASD did not necessarily lead to the school putting in place a structure of support.

The data concerning the students in the sample not only confirmed that all students with an ASD have a high level of need for educational and behavioural support but also indicated that students with Asperger's Disorder and students with ASD-NOS generally have a greater level of need for support, especially in terms of problem behaviours. Yet the seven students who did not have a Student Support Group in place included five (71%) of the seven students with Asperger's

Disorder, one (25%) of the four students with ASD-NOS, and one (14%) of the seven students with Autistic Disorder. In this sample then, a student was most likely not to have an additional support structure in place if he or she had a diagnosis of Asperger's Disorder. On this basis it might be argued that the current criteria for eligibility for the Program for Students with Disabilities are too narrow and fail to take into account a wide range of student problems that have implications for classroom functioning.

Evaluation of the Effect of the Model on Teachers

The research model was designed to take account of research such as that of Helps et al. (1999) which found that many teachers felt inadequately trained and insufficiently supported when taking on the challenge of educating a student who had an ASD. The whole staff session was aimed at helping staff to understand more about autism and also, through that understanding, to work toward ways of supporting each other more. It was hypothesised that the teachers involved in the implementation of the research model would gain in knowledge and would benefit from their involvement in the process. This hypothesis was supported by the teachers' responses to the pre-intervention and post-intervention surveys.

Teacher Knowledge about Autism and Knowledge of the Student

Teachers indicated that they had gained in knowledge about autism through participating in the implementation of the research model. In a question in both pre-intervention and post-intervention surveys teachers were asked to indicate whether they had much knowledge, some knowledge, or no knowledge in the following areas: general features of autism, variation in presentation, specific educational interventions, sensory difficulties, scattered skills, changing the classroom environment, and management of specific behaviours. In pre-intervention survey responses 0 to 5% of teachers indicated *much knowledge* in the various areas but in post-intervention survey responses 44 to 61% of teachers indicated *much knowledge* in the various areas.

In relation to modifying the environment for a student with an ASD, 78% teachers indicated in pre-intervention survey responses that they thought it was important to do this but only 11% of teachers indicated that they had received enough training in this area. In post-intervention survey responses 100% of the teachers indicated that had more ideas about modifying the classroom environment.

In relation to modifying teaching materials for a student with an ASD, 83% of teachers indicated in pre-intervention survey responses that they thought it was important, although only 39% indicated that they had been able to do this in the way they believed was important. Only 11% of teachers indicated that they had received any training in this area and even then they indicated that the training they had received was very minimal. In post-intervention survey responses, 94% of teachers reported that they had more ideas about modifying teaching materials and 83% identified ideas they had gained about modifying teaching materials. They mentioned having learnt about the need for shorter, more explicit, clearer, uncluttered, and step by step instructions for students. They also mentioned learning about increasing the use of visual aids and concrete materials in supporting students.

Teachers also reported benefit in terms of having greater access to additional professional support. In pre-intervention responses 56% of teachers reported previous access to additional professional support, but 40% of these teachers indicated that this support was limited. As well, only three of the nine schools had a teacher who had time specifically allocated to the role of integration support. In post-intervention survey responses all of the teachers indicated that greater access to professional support through the implementation of the model had been of benefit.

Teacher Benefit from Participation in the Process

Teacher survey responses also identified that teachers had found more communication and collaboration with parents to be of benefit. In pre-intervention survey responses 83% of teachers indicated that parents' involvement with teachers was *vitally important*, but in post-intervention survey responses all of the

teachers indicated that this was *vitally important*. More teachers also indicated in post-intervention survey responses the importance of gaining parents' knowledge of their child.

In general, the teacher survey responses were enthusiastic in their expression of the benefit of the process in terms of professional support, collaboration with parents, and in terms of the practical support they received in their work with the student with an ASD.

In responses to the survey about the whole staff session, 94% of the responses were indicative that the session had promoted changes amongst staff. Sixty-five percent of those that indicated change felt it was occurring through other teachers becoming more understanding and less critical, 23% felt change was occurring through teachers recognising that the student with an ASD was the responsibility of all staff, and 6% indicated that there was more discussion between staff. These responses indicated that the culture of the school was changing and that as a consequence, the classroom teacher was feeling more supported.

Factors Contributing to the Effectiveness of the Model for Teachers

In considering why the implementation of the research model was effective in supporting the participating teachers, the following factors may be considered.

Teacher learning as part of ongoing experience

Through the implementation of the research model teachers had opportunities to gain knowledge directly through the whole staff session and in the introductory session to the regular planning meetings. They also had opportunities to learn at the regular planning and support meetings through the process of discussing the problems experienced by the student and designing possible interventions. When interventions were successful it was very encouraging for teachers, but if it was not immediately successful it also meant that each goal could be fine-tuned through further reflection, discussion and planning as necessary. This process provided ongoing support for the teacher if

further problems emerged. The regularity of the meetings meant that there was time to refine and provide additional support if necessary before moving on to other goals. In all of these ways then, a learning environment was established in the context of trialling interventions. This process facilitated ongoing learning and the development of a knowledge base for the teacher that was built on collaborative practice as well as experience of the outcomes of the interventions already implemented. In addition, learning could occur as teachers discussed in staff meetings ways to implement suggested school-wide interventions.

Realistic strategies for teachers in developing an inclusive classroom

The present research sought to implement interventions that were realistic and achievable and that teachers were willing to embrace. For some teachers, interventions were realistic and achievable when the whole class participated in and benefited from the interventions (e.g. visual timetables, visual story prompt sheets, relaxation sessions, or sessions to focus on how to manage feelings). For some teachers, interventions were realistic and achievable when the student with an ASD worked on the same task as other students but adjustments were made to the content of the task or to performance expectations, or structural supports were provided, whether concrete materials, additional visual instructions or supports, peer support, and/or technological support. For some teachers, interventions that went beyond the general curriculum and which involved only the student with an ASD were also realistic and achievable. However, some of these individually-based interventions were only possible if extra human resources were available, whether because a teacher aide had been allocated to the student, because other professionals could be asked to be involved, or because other teachers were willing to be involved.

The provision of time

In post-intervention responses five teachers mentioned that what they needed most from their school community was time, whether time to communicate with other staff, time to communicate with parents, or time for making resources. In other recent research (Shaddock, Neill, Van Limbeek, &

Hoffman-Raap, 2007) it was found that the greatest concern of teachers was that they did not have the time or resources to make adaptations for students with diverse individual needs.

The present research sought to help create time for teachers and was partially successful in doing so in terms of initiating specific additional time release for three teachers. All the other teachers had to use their own time release, other break times, or time after school to participate. However, all teachers participated in the project voluntarily and it was evident that teachers were generally very willing to give of their time. Their commitment in doing this was remarkable but it was costly to them to do this. It was, therefore, important to teachers that something was gained for themselves and for the students with an ASD from the giving of their time. This was achieved in the regular fortnightly planning and support group meeting by focussing on the needs of the student. When a teacher aide was allocated for a student the aide was also part of the collaborative process. It was helpful for the teacher (and the teacher aide) to have time together as part of the planning and support group in which they were both involved in the decision making. In addition, all of the planning and support group were very willing to help the teachers to implement strategies. The planning and support group frequently actually made the visual resources and support materials needed by the teacher. These items take a great deal of time to produce as an individual but much less time as part of a team. They were produced either during set meeting times or in additional times and parents were very willing to give of their time in producing them.

Whole staff support

In the post-intervention survey responses 44% of the teachers indicated that what they most needed from their school environment was support from other staff. Teachers indicated that the support needed was both in terms of other staff understanding the needs of a student with an ASD and in terms of other staff supporting new programs for the student. A change in school culture was indicated in the survey responses to the whole school session in which teachers reported noticing that other staff had become less critical of the student with an

ASD and more open to sharing the responsibility of supporting the student. It was encouraging that there were these signs of a supportive culture continuing to develop and this may well have been one of the factors contributing to the success of the project. However, the fact that teacher's mentioned the need for support from other staff in post-intervention responses indicated that it was an ongoing desire of teachers.

Evaluation of the Effect of the Model on Parents

The implemented research model was firmly based on a commitment to involving parents as active contributors to the process. It was hypothesised that the parents involved in the implementation of the research model would gain in knowledge and would benefit from their involvement in the process. This hypothesis was supported by the parents' responses to the pre-intervention and post-intervention surveys.

Parent Knowledge about Autism and Benefit from Participation in the Process

Parents indicated that they had gained in knowledge about autism through participating in the implemented model. In the pre-intervention survey parents were asked if they felt that they had enough knowledge about ASDs and 56% of parents indicated that they did. However, in the post-intervention survey parents were asked if they felt they now had more knowledge about ASDs and 89% of parents indicated that they did. The most frequently reported areas of knowledge gain were that they had more knowledge of the reasons for their child's behaviours and more knowledge of what to do to support their child.

All of the parents indicated that having greater access to their child's classroom teacher had been of benefit. Some parents reported an improved relationship with the teacher in which they felt that they had been heard. Some parents reported benefit in knowing more about what was happening with their child at school. Some parents reported the benefit of knowing about what was being put in place for their child at school so they could be supportive at home. One parent reported the benefit of feeling less anxious about what was happening for her child at school. Communication between parents and teachers was found

to be so important that for some students it was also necessary to set up communication structures between the teacher and parent that were more frequent than fortnightly.

There may have been a range of reasons contributing to the effectiveness of the model for parents but one factor seems to stand out in importance and this was communication. When parents were asked in the post-intervention survey what ongoing support structure they would like most for themselves, fifteen (83%) of the eighteen parents said they would like ongoing communication with the teacher. It seemed that through participation in the research model parents had experienced the benefit of communication with teachers.

The Importance of Parental Communication with Teachers

Communication had occurred throughout the implementation of the research model in a number of ways. Through the regular planning and support group parents had opportunity to discuss their concerns with their child's teacher. This occurred either through parents volunteering the information, or through discussion together about the behavioural assessment results in the planning and support group meetings.

When necessary, the autism consultant was able to be an effective communication bridge between parents and teachers when the parent was struggling in her relationship with the teacher. This need was indicated in some of the parents' survey responses. However, the regularity of the meetings, and the focus on what could be done to support the student, meant that all participants were working toward a common goal. This gave a common purpose that the autism consultant could facilitate through communication.

A range of parental concerns could be expressed in the regular meetings. For example, parents were able to talk with teachers about problems at home (such as difficulties they were having with their child's behaviours or problems they were having in getting their child to complete homework). It was previously noted that the attention problems, aggressive problems, rule-breaking, and social problems of the students were generally higher according to parent report than according to teacher report and that parents' survey responses reflected that they

were acutely aware of their child's social difficulties. In the research model parents had an opportunity to discuss these concerns.

The planning and support group then provided an opportunity for parents to work collaboratively with the teacher on problem-solving and putting interventions in place. They were able to share their knowledge about their child and to help in practical ways. In these ways, parents were an active part of the process of working toward the inclusion of their child and they felt empowered and valued. In addition, discussions about strategies that the teacher could use were equally valuable strategies that parents could use.

The communication and problem solving that occurred between parents and teachers had a range of benefits for the psychological well-being of parents. Discussion in the ongoing sessions enabled personal support for parents and also the sharing of possible community agencies through which the parent could obtain further support if desired.

Limitations

In the present research the assessments were undertaken primarily to gain specific information about each student's functioning, to understand the needs of each student better, and to facilitate informed decision making and goal setting regarding interventions to be worked on in the course of the research project. The results indicated that this was part of the success of the process. However, this strength was also the major limitation of the present research in that the researcher was involved in both the implementation of the research model and its evaluation. This limitation would have been overcome by having the evaluation carried out by an external evaluator. This was not possible in the present research due to a lack of financial resources to employ an external evaluator. However, all the instruments used in the present research have good reliability and validity and there was also evidence of reliability when using the items used in the Rated Disco Items (Leekam et al., 2002).

The present research was also based on relatively small numbers of participants. The intensity and length of time of the support provided to teachers

precluded a higher number of student participants. However, endeavouring to have larger numbers in future studies is recommended.

Another limitation in the present research was that some of the students were funded under the Program for Students with Disabilities and some students were not. In all of the schools in which students were funded, the students' funding was allocated to the employment of teacher aides. This meant that in this research most of the students with Autistic Disorder had teacher aide support, whereas most of the students with Asperger's Disorder and most of the students with ASD-NOS did not. Potentially, this factor may have contributed to the measured differences between students in each autistic diagnostic category.

Recommendations

There are a number of areas that stand out to the writer as being of importance in supporting school communities in including students with an ASD.

1. Structured teaching practices that support the cognitive deficits of students with an Autism Spectrum Disorder should be utilised.

Structured teaching practices were used in the present research to support students with an ASD to take part in school based activities. Structured teaching practices were also found in the present research to be helpful in terms of supporting students' social communication, behavioural and emotional difficulties. It is recommended that these are the sort of adaptations that teachers need to be learning about.

2. Teacher training should be linked with practice.

It was found that teachers were willing to learn and willing to give of their time but they wanted their learning to have practical outcomes in their day-to-day teaching. The present research provided evidence that linking training with practice results in benefits to teachers.

3. Teachers need help in modifying the classroom and teaching materials in practical and time efficient ways.

The present model was successful in helping teachers to actually produce materials where necessary and in helping teachers to learn about other ways in which adaptations can be implemented in practical and realistic ways and sometimes on a whole class basis. However, despite teachers reporting a gain in knowledge in this area, the writer believes that teachers need more support and professional development in learning how to modify and adapt curriculum in ways that are manageable, practical and feasible. Part of the difficulty for teachers seems to be in terms of knowledge but also in terms of not feeling that they have time to make these adaptations. There may well be a need for teachers to learn more about a range of time efficient ways of making these adaptations as suggested by Shaddock, Hook, et al. (2007) and Shaddock, Neill, et al. (2007). Shaddock, Neill, et al.'s (2007) recognition that teachers need help to make adaptations has arisen from research. In a recent resource Shaddock, Giorcelli, and Smith (2007) give information to help teachers in making adaptations.

4. Students with an Autism Spectrum Disorder will need particular supports to help with executive functioning deficits.

The present research indicated that students with an ASD will need external supports to help them compensate for executive functioning deficits and that these supports may be necessary for some time.

5. Students with an Autism Spectrum Disorder need to be assessed for specific academic difficulties and then need to be supported and accommodated, if necessary.

In the present research many students with an ASD were found to have a range of academic difficulties. Students were also found to have Specific Learning Disabilities and this underlined that overall intelligence is not a sufficient indicator on its own of the academic needs of a student. Teachers need more education about how to support students with Specific Learning Disabilities.

6. Students with an Autism Spectrum Disorder need more support in relation to social, emotional, and behavioural problems.

A considerable number of students with an ASD were indicated to have a high level of problem behaviours. Students in all autistic diagnostic categories were indicated to have problem behaviours, but according to parent report, this was indicated to be particularly the case for students with Asperger's Disorder and students with ASD-NOS. Given the theory that increasing stress builds on the core deficits of ASDs and can lead to problem behaviours (Bartak et al., 2006), it is essential that schools do what they can in terms of supporting core deficits. It is possible that in doing this another level of behavioural problem will be prevented. The importance of this support is underlined given that the present research data relates to primary school aged students with an ASD. It is of concern that this level of problem behaviour was indicated at this young age. More support for students in relation to these problems in the primary school years may be preventative of an escalation of behavioural problems in adolescence.

7. Access to the Program for Students with Disabilities needs to be broadened.

Much of the analysis of differences according to autistic diagnostic category highlighted that students with Asperger's Disorder and students with ASD-NOS have a range of difficulties including academic difficulties, marked sensory processing differences, and problem behaviours. However, it is difficult for students in these autistic diagnostic categories to satisfy the present funding criteria because the present criteria do not take sufficient account of the range of difficulties experienced by students in either of these autistic diagnostic categories.

8. Whole school support should be provided for students with an Autism Spectrum Disorder and for the classroom teachers of students with an Autism Spectrum Disorder.

Whole staff understanding and support of a student with an ASD was found to be essential in the present research. It was important for the student but it was also very important for the classroom teacher. The writer considers that the whole staff session in which more communication was able to occur between staff

was a vital contributor to teachers not feeling alone and unsupported. The whole staff session encouraged staff to explore ways in which they could support each other. Support for teachers of students with a disability should occur within their school community as well as coming from outside sources.

9. Parents should be actively included in schools in sharing knowledge of their child with teachers, in collaboratively planning with teachers for their child's educational support, and in helping teachers in practical ways.

The present research found that schools can benefit from the knowledge and time that parents can bring to schools. In particular, parents were found to have a more acute awareness of their child's social problems than teachers, so schools and teachers need to hear parents' concerns.

10. A facilitator of special needs support to be designated within each school.

Only three of the nine schools in the present sample of rural and regional schools had a teacher designated to the role of facilitating special needs support for students. In the other schools the role was delegated to the school principal or assistant principal. It can be difficult to give the role adequate time if the designated person has multiple roles and limited time. In the present research the autism consultant came into the school from outside and the key features that she contributed were (a) knowledge of autism, (b) knowledge of good practice, (c) an ability to undertake assessment, and (d) designated time to give to the role.

Conclusion

The collaborative model of support that was implemented allowed for teachers and parents to come together in the context of a school community that was embracing cultural change and in the context of other professionals providing support as needed. In the implemented model the autism consultant acted as a facilitator for this to occur. It is the writer's view that inclusion of a student with an ASD will necessarily involve the regular coming together of all parties. In a collaborative model all parties respect the knowledge that everyone brings and

communication is valued. This communication is not superficial but is realistic about the presenting concerns of the student and is also realistically committed to problem solving together. The present research indicated that the outcomes of coming together in this way have benefit in terms of behavioural outcomes for the student and knowledge gains and support for teachers and parents. This process, in which teachers and parents were committed to working toward inclusive solutions, was a process that enriched the educational community and produced positive outcomes for students, teachers and parents.

APPENDIX A

BARTAK, BOTTROFF, AND ZEITZ' DYNAMIC MODEL OF AUTISM

Quaternary

Psychiatric syndromes and personality disorders
- Delusional
- Paranoia
- Depressive
- Anxiety

Behaviors

Tertiary

Internal
- Anxiety
- Low self-esteem
- Paranoid ideation

External
- Destructiveness
- Physical assault
- Self-injury

Stress

Secondary
- Ritualistic behaviors (e.g., insistence on sameness)
- Poor sensory integration
- Poor consensual validation of ideas about other people
- Oddities of expressive social behavior

Primary

Deficit in processing information
- People's feelings, motives, behavior, and social contexts
- Receptive and expressive language
- Executive function skills involving weak central coherence

[From "Therapist insights in working with stress in people with Autism Spectrum Disorder," by L. Bartak, V. Bottroff, & J. Zeitz, in *Stress and coping in autism* (p. 249), ed. M. G. Baron, J. Groden, G. Groden, & L. Lipsitt, 2006, Oxford, England: Oxford University Press.]

APPENDIX B

Criteria for AUTISM SPECTRUM DISORDER
(Wing and Gould, 1979)
From DISCO items

All must be present

1. SOCIAL IMPAIRMENT

Quality of social interaction
DISCO p. 115 – 116

Rating made on basis of interview. Any of the following.

00 Does not interact – aloof and indifferent

01 Interacts to obtain needs, otherwise indifferent

02 Responds to (and may initiate) physical contact only, including rough and tumble games, chasing and cuddling etc

03 Generally does not initiate, but responds to *social* (not just physical) contact, if others, including age peers make approaches. Joins in passively, e.g. as a baby in a game of mothers and fathers, or, with adults, in adult social situations. Tries to copy but with little understanding. Shows some pleasure in passive role (unlike groups 0, 1,2) who move away once physical needs are satisfied)

04 Makes *social* approaches actively, but these are usually inappropriate, naïve, peculiar, or bizarre – 'one sided'. The behaviour is not modified according to needs, interests and responses of the person approached.

05 Over-formal, stilted, rigid, over-polite or calmly outspoken in social interaction (can be a subtle problem but becomes more apparent on prolonged acquaintance)

[See additional categories listed in DISCO]

2. COMMUNICATION IMPAIRMENT
Reciprocal communication
DISCO   P. 44   No. 2

☐   If S communicates in any way, is this a two way communication, or is it one-sided on S' terms only, concerning only S' needs or interests? Does S respond with interest to replies and follow theme of an interchange?
Eligible if 0, 1 or 8

   0 Communicates needs only

   1 Communicates only on own terms, one-sided, repetitive

   2 Enjoys reciprocal communication at age level

   8 Does not communicate

3. IMAGINATION IMPAIRMENT
Imaginative activities
DISCO   p. 67 No.1

☐   Does S have any pretend play or other imaginative activities?
Eligible categories listed

00 No play with model toys (no interest in the function of trains, cars and dolls , although S may handle them in the same way as any other objects).

01 Plays with real household equipment using it for its real purpose – no interest in miniatures (e.g. sweeps with real broom, digs with real spade)

OR
Repetitive pretend play
DISCO   p. 69 No.1
   Eligible at 0 or 1 level

☐   If S has pretend play, is it varied and showing development, or is it repetitive, always repeating the same series of actions?

0 Marked repetition

1 Sometimes repetitive

2 Play is varied

8 No spontaneous pretend play

4. REPETITIVE ACTIVITIES

Limited pattern of self chosen activities
DISCO   p. 103   No.1

Eligible at 0, 1 or 8 level

☐   What does S do if left to choose? Give a list of S' usual activities when nothing is provided or suggested.
(This rating is a summary of S' overall pattern of activities – refer to all of part 7 -Repetitive Stereotyped Activities p.83-100)

0 Engages only in repetitive activities

1 Has some varies interests but repetitive activities are a prominent

part of S' repertoire

2 Activities varied and flexible

8 No activities

Criteria for CHILDHOOD AUTISM
(ICD 10, [same as DSM IVTR])
From DISCO items

A   ONSET BEFORE 3 YEARS

At least one of the following must be present   ☐
[Page numbers refer to DISCO]

Set back in language   p. 18 ☐
Set back in play   p. 18 ☐
Set back in social skills   p. 18 ☐

Obeying instructions not dependent on context p.39 Q.1
    Marked concern ☐

Phrases – Combining 2- 3 words in communicative phrases p. 43
    Either   not yet achieved   ☐
                Late   [communicative phrases not used by 3 years]

☐

Selective social attachment p.53
    [Clear preference in the attachment to carers and other well known people]
    Not achieved by 3 or more years   ☐

Development of pretend play p.69
    [Simple pretend play alone]
    Marked concern   ☐

CLINICAL FEATURES

There must be at least <u>6</u> items in total from B1, B2 and B3

with at least <u>2</u> from B1 and <u>one</u> each from B2 and B3 ☐

B1 SOCIAL IMPAIRMENT

<u>B1a</u>   Item present if at least 3 are indicated ☐

Imperative gesture p.49 Q. 2
   No imperative gesture ▱
   Takes people by hand to designate an object S wants ▱

Declarative gesture [joint referencing]   p.49 Q. 3
   Does not use such gesture ▱

Use of nodding and shaking head to mean 'yes' and 'no'. p.50 Q. 4
   No use ▱

Instrumental gestures   p.50 Q. 5
   No instrumental gesture ▱

Descriptive gestures   p.50 Q.6
   No descriptive gesture ▱

Use of non-verbal communication in social interaction   p.52 Q.6
   Markedly inappropriate ▱
   Uses too little to rate ▱

Eye contact p. 54 Q.2
   Little or no eye contact   ▱

Brief glance p. 54 Q.3
   Marked   ▱

Blank gaze p. 54 Q.4
   Marked and frequent   ▱

Stares p. 55 Q.5
   Marked staring or otherwise inappropriate   ▱

_B1b_   **_Item present if at least 2 are indicated_** ☐

Interest in peers   p.60 Q. 1
> Indifferent or positively rejects ▱

Interaction with peers   p.60 Q. 2
> No interaction. Prefers solitary pursuits ▱
> No interaction now but never interacted ▱

Quality of interaction with peers   p.61 Q. 4
> Markedly inappropriate ▱

Emotional response to age peers p.61 Q. 5
> Markedly inappropriate ▱

Using age peers as mechanical aids   p.62 Q. 7
> Marked, frequent ▱

Friendships with peers   p.62 Q. 8
> No interest though understands concept ▢
> Wants friends but cannot form friendships; or prefers a
> particular child but no real sharing of activities; or thinks
> every acquaintance is a friend ▱

Quality of friendships with peers   p.62 Q. 9
> Relationship based only on sharing same obsessional interest
> [e.g. trains] ▱

Group/ team games   p.64 Q. 4
> Runs around with others but no idea of any rules or aims ▱

Taking turns   p.63 Q. 2
> Takes part in relevant activities but will not take turns;
strongly resists if made to take turns ▱
> Does not join in turn taking activities ▱

Social activities with older peers   [if older than 10years] p.64 Q. 6
> Does not take part in peer group activities ▱

_B1c_   **_Item present if at least 3 are indicated_** ☐

Using adults as mechanical aids   p.56 Q.10
>   Frequent ▱

Emotionally expressive gestures   p.50 Q.7
>   None ▱

Greeting parents   p.55 Q.7
>   Ignores ▱

Response to visitors p.56 Q.9
>   Becomes disturbed in behaviour; may be aggressive or push visitors out the door; and/or shows other markedly inappropriate behaviour ▱
>   Ignores or goes to own room ▱

Comfort when hurt   p.56 Q.11
>   No reaction or shows distress but does not come for comfort ▱
>   Responds in a repetitive or odd way [e.g. always says 'put plaster on it' regardless of site of injury; takes carers hand and rubs it on injury site; attacks carer etc. ▱

Giving comfort to others   p.57 Q.13
>   Does not offer comfort ▱

One sided approaches   p.57 Q.14
>   Approaches mostly or always one-sided   ▱
>   Some reciprocal interaction, some one-sided ▱

Awareness of other's feelings p.58 Q.15
>   Indifferent to other's feelings   ▱
>   Odd or bizarre response   ▱

Laughs at distress   p.58 Q.16
>   Frequent ▱

Response to change caused by other's injury p.58 Q.17
>   Marked ▱

B1c [continued]

Behaviour in public places p.108 Q.7
  Major problem with outings ▱

Personal modesty [unaware]   p.108 Q.8
  Marked ▱

Psychological barriers   p.108 Q.9
  Marked ▱

Approaching strangers   p.109 Q.10
  Frequently ▱

Embarrassing remarks   p.109 Q.11
  Marked ▱

Interrupting conversations p.109 Q.12
  Marked ▱

Inappropriate response to other's emotions   p.109 Q.13
  Marked ▱

_B1d_   **_Item present if at least underline one is indicated_** ☐

Reaction to other's happiness p.59 Q.19
  Indifferent or may be jealous ▱
  Mild interest or learnt response ▱

Sharing interest and enjoyment p.59 Q.20
  No sharing of interest ▱
  Mild interest, or learnt behaviour, or share a few activities
  only, or sharing limited to S's special interests ▱

B2. **COMMUNICATION IMPAIRMENT**

B2a **Item present if _both_ are indicated** ☐

Development of expressive language p. 42

    No speech or sounds at all,
        or makes noises [not normal baby sounds]   ▱
        Babbles, gurgles, coos, laughs without meaning   ▱

Non verbal communication [body language] p. 44 Q.1

    If S has limited or no speech

    No communication   ▱
    Limited, simple methods only such as pulling people, pointing, a few
concrete gestures   ▱

B2b **Item present if the _one_ variable is indicated** ☐

Reciprocal communication p. 44 Q.2

    Communicates needs only   ▱
    Communicates only on own terms, one-sided, repetitive ▱

B2c **Item present if at least 2 are indicated** ☐

Immediate echolalia   p.44 Q.3
    Marked ▱

Delayed echolalia or repetitive use of words or phrases   p.45 Q.4
    Marked ▱

Reversal of pronounds   p.45 Q.5
    Marked ▱

Idiosyncratic use of words or phrases or signs   p.46 Q.6
    Marked ▱

Long winded, pedantic speech   p.46 Q.7
    Marked, frequent   ▱

B2c [continued]

Content of speech   p.47 Q.9
        Speech is garbled, nonsensical, vague, inconsequential even to those who know S well – marked problem ▱

Repetitive questions   p.98 Q.13
        Marked ▱

Repetitive themes   p.98 Q.14
        Marked ▱

B2d   ***Item present if at least <u>one</u> is indicated*** □

Imitation of social and domestic actions [retrospective – early years] p.65 Q.1

   0 No imitation   ▱
   1 Imitates sounds and simple movements made by others
      [e.g. hand clapping]   ▱
   2 Imitates waving good-bye   ▱
   8 Too old now but never achieved 'briefly copying everyday actions – feeding doll, reading book, washing clothes etc' or skills above this level ▱

Imaginative activities p. 67 Q 1   [Later levels listed involve pretend play]

        0 No play with model toys [no interest in the function of trains, cars and dolls , although S may handle them in the same way as other objects]   ▱
    01 Plays with real household equipment using it for its real purpose – no interest in miniatures [e.g. sweeps with real broom or spade etc]   ▱
    02 Holds doll, toy animals as if real, at least some of the time [hugs and kisses]   ▱

Repetitive pretend play p.69 Q.1
        Marked ▱

B3   REPETITIVE ACTIVITIES

B3a   *Item present if at least <u>one</u> is indicated* ☐

Clinging to objects   p.94 Q.1
    Marked ☐

Collecting objects   p.94 Q.2
    Marked ☐

Fascination with specific objects   p.95 Q.3
    Marked ☐

Maintenance of sameness in environment p.96 Q.8
    Marked ☐

Insistence on perfection   p.96 Q.9
    Marked ☐

Limited pattern of self-chosen activities   p.103 Q.1
    Engages only in repetitive activities ☐

B3b   *Item present if at least <u>one</u> is indicated*   ☐

Acting out roles   p.98 Q.15
    Marked ☐

Arranging objects   p.95 Q.4
    Marked ☐

Repetitive acts with objects   p.95 Q.6
    Marked ☐

Eats only a small range of foods p.97 Q.10
    Marked ☐

Maintenance of sameness in routines   p.97 Q11
    Marked ☐

Activities related to special skills   p.99 Q.16
    Marked ▱

Collecting facts on specific subjects   p.99 Q.17
    Marked ▱

Fascination with TV/videos   p.99 Q.18
    Marked fascination ▱

Other repetitive routines   p.100 Q.19
    Marked ▱

_B3c_   **_Item present if at least <u>one</u> is indicated_** ☐

Unusual movements of hands or arms   p.83 Q.2
    Marked ▱

Self spinning   p.84 Q.4
    Marked ▱

Rocking [standing up]   p.84 Q.6
    Marked ▱

Complex movements   p.84 Q.7
    Marked ▱

_B3d_   **_Item present if at least _underline_one_ is indicated_**   ☐

Smelling objects or people   p.88 Q.5
    Marked ▱

Touching objects   p.88 Q.6
    Marked ▱

Repetitive aimless manipulation of objects [not near eyes]   p.89
Q.9

    Marked ▱

Fascination with sounds p.91 Q.2
    Marked ▱

Bright lights and shiny objects   p.92 Q.1
    Marked ▱

Interest in watching things spin   p.92 Q.2
    Marked ▱

Twisting hands or objects near eyes   p.92 Q.3
    Marked ▱

Interest in studying angles or objects p.92 Q.4
    Marked ▱

Interest in parts of objects p.95 Q.5
    Marked ▱

Abstract properties of objects p.96 Q.7
    Marked ▱

<div align="center">

APPENDIX D

<u>Diagnosis of Asperger Syndrome</u>
<u>[Wing 1982, Gillberg and Gillberg 1989]</u>
Using DISCO items

</div>

SOCIAL IMPAIRMENT
[At least 2 from 1a, b, c, and d]

1a) ITEM PRESENT IF ONE OR MORE OF THESE ITEMS IS INDICATED

One sided approaches

How does S approach others? Is the approach one-sided, on S's terms only, when and how S choses, regardless of the needs and feelings of the person approached? Or Does S approach people as a source of physical sensations e.g. touching hair, skin, clothes etc

[This type of behaviour may seem superficially to be seeking comfort, affection and/or interaction but has an odd, repetitive, one-sided quality].

<div align="center">[Ref p.57, No.14]</div>

Mostly or always   □

Some reciprocal interaction, some one-sided □

Quality of interaction [Clinician's rating]   [Ref p.115-116]

Generally does not initiate but responds to social [not just physical comfort, if others including age peers make approaches.   Joins in passively.   Tries to copy but with little understanding.   Shows some pleasure in passive role. [03]   □

Makes social approaches actively, but these are usually inappropriate, naïve, peculiar or bizarre – 'one-sided'. The behaviour is not modified according to the needs, interests and responses of the person approached. [04]   □

Over formal, stilted, rigid, over polite or calmly outspoken in social interaction [can be a subtle problem but becomes more apparent on prolonged acquaintance]. [05]   □

1b) ITEM PRESENT IF ONE OR MORE OF THESE ITEMS IS INDICATED

Giving comfort

How does S react to others in distress? Does S try to give comfort? If S does, how does he do this?   [Ref p.57, No.13]

Does not offer comfort   ☐   Sometimes offers comfort   ☐

Awareness of feelings

Is S aware of how others feel?   How does S react to others distress? Is S aware of others personal space?   [Ref   p.58, No.15]

Indifferent to others feelings   ☐   Odd or bizarre response   ☐

Emotional response to age peers

Does S show sympathy and affection to age peers?   Or does S ignore or respond inappropriately to age peers emotions, such as laughing at their distress, showing pleasure if another peer is scolded?
[Ref p.61, No.5]

Markedly inappropriate   ☐

1c) ITEM PRESENT IF ONE OR MORE OF THESE ITEMS IS INDICATED

Interaction with peers

Does S spontaneously join in with activities of age peers? Does S join in only if led by an adult or age peer? [Code as present even if interaction is inappropriate]   [Ref p.60, No.2]

No interaction. Prefers solitary pursuits ☐ Interacts if led by another ☐

Quality of interaction with peers

How does S interact with other children? Is the interaction friendly, reciprocal, appropriate or is it inappropriate because aggressive, passive, one-sided, odd or bizarre in some way?   [Ref p.61, No.4]

Markedly inappropriate   ☐

Conventions of peer interaction

How does S behave if age peers visit him/her at home, or when S visits others?   Does s interact appropriately, or does S e.g. invite peers to visit and then got to own room and pursue own interests? If invited to a party, does S join in appropriately or behave in odd ways? [Ref p.61, No.6]

Markedly inappropriate   ☐

Mechanical- using peers as mechanical aids

Does S use age peers solely as aids in own activities, e.g. to collect materials, to assist in building some construction, to take a specified part in a scenario created by S?   [Ref p.62, No.7]

Marked, frequent   ☐

Friendships

Does S have a special friend? Does S want friends but not know how to form a friendship? Does S think anyone who speaks kindly to them is a friend? [Ref p.62, No.8]

No interest, though understands concept ☐

Wants friend but cannot form friendships; or prefers particular child but no real sharing of activities; or thinks every acquaintance is a friend.

☐

Quality of friendship

If S has a special friend, how do they relate to each other? Do they share special interests? Do they visit each other's homes?   Do they help and support each other?   [Ref p.62, No.9]

Relationship based only on sharing same obsessional interest [e.g. trains]

☐

Social activities [if 10 plus years]

Does S take part in social activities with age peers such as clubs, dances, group outings etc?   [Ref p.64, No.6]

Does not take part in peer group activities   ☐

1d) ITEM PRESENT IF ONE OR MORE OF THESE ITEMS IS INDICATED

Anger toward parents

Is S often angry and resentful towards parents?   Does S blame them for all of his/her problems?   [Ref p.108, No.6]

Marked, frequent   ☐

Approaching strangers

Will S make approaches to anyone, even strangers in the street?
[Ref p.109, No.10]

Frequently   ☐

Embarrassing remarks

Does S make naïve and embarrassing personal remarks in public; talks about loud subjects in a loud voice in company; asks strangers inappropriate, embarrassing questions; comments on people's physical peculiarities in their hearing?   [Ref p109, No.11]

Marked   ☐

Interrupts

Does S lack awareness of social taboos in conversation [e.g. interrupts frequently; makes irrelevant remarks; tries to pull person away to stop them continuing a conversation; other attention – getting behaviours that interrupts conversation?   [Ref p109, No.12]

Marked   ☐

Inappropriate response to others emotion

Does S upset people by reacting in inappropriate ways to other's emotions; e.g. laughs at other's distress; is angry if other's laugh though not directed at S? [Ref p.109, No.13]

Marked ☐

Demands carer's attention

Does S demand carer's attention because of specific questioning, demanding specific responses, wanting videos played over and over again, wanting furniture and ornaments arranged in a precise ways etc?   Does this interfere with carers own activities to a major degree?

[Ref p.111, No.18]

Marked ☐

2. NARROW INTERESTS

At least **one** of the following

Collecting objects

Does S collect any particular kind of object for no apparent purpose beyond amassing larger numbers of the item? [E.g. leaves, wrappers, teapots, trains]. Tends to notice and react if even one item missing. [Ref p. 94, No. 2]

Marked ☐

Fascination with objects

Is S fascinated with particular objects that S likes to look at? Does the sight of certain objects produce great excitement [e.g. trains, lampposts etc]? [Ref p. 95, No 3]

Marked ☐

Abstract properties

Is S unusually interested in the abstract properties of objects such as colour, shape, number etc/ [e.g. fascination or afraid of anything yellow, identifies people by numerical attributes such as birthday]? [Ref p. 96, No 7]

Marked ☐

Activities related to Special Skills

Does S have repetitive activities dependent on special skills [e.g. memorising time tables, routes, computer games, dismantling objects, drawing on a particular theme, fascination with letter or number etc.]? [Ref p. 99, No 16]

Marked ☐

Collecting facts on specific questions

Does S amass facts on certain subjects though usually lacking in depth or understanding? [Eg meteorology, modes of transport, ancient civilisations, specific real or imaginary people]

[Ref p.99, No 17]

Marked ☐

TV, video

Does S watch TV or videos? [Or computer] Is this an intense interest? Does S like to see the same items over and over again? How long will S go on watching?

[Ref p. 99, No 18]

Marked fascination ☐

Other

Does S have any other complicated repetitive routines?
[Ref p. 100, No 19]

Marked ☐

Limited pattern of self chosen activities

What activities does S do if left to choose?
[Ref p.103, No 1]

Engages only in repetitive activities ☐

Has some varied interests but repetitive activities are a prominent part of S's repertoire

☐

3. REPETITIVE ROUTINES

At least **one** of the following

Acting out roles

Does S act out role of an object, animal, fictional person or real person in a repetitive stereotyped way? [Ref p. 98, No. 15]

Marked ☐

Sameness of the environment

Is S often concerned with the maintenance of small, often trivial aspects of the environment [e.g. resits change in arrangement of furniture, distressed if curtains in bedroom changed, will only use certain cup, certain brand etc]? For some the maintenance of sameness is not shown by overt temper but by ingenious ways of maintaining sameness] [Ref p. 96, No 8]

Marked ☐

Sameness of routines

Does S insist on following certain routines? [E.g. same route to a familiar place, same place at table, always stands up and turns around 3 times between next meal course, etc]?
[Ref p. 97, No11]

Marked ☐

Clinging to home

Does S intensely dislike leaving home? [E.g. refuses to go away on a holiday, or when away constantly wanting to come home etc.] The attachment is to the house rather than to the inhabitants.]?
[Ref p. 98, No 12]

Marked ☐

Repetitive Questions

Does S ask the same questions or series of questions repeatedly, regardless of the replies? [E.g. how old are you? Where do you live?]
[Ref p.98, No 13]

Marked ☐

Repetitive Themes

Does S talk on and on about one theme or a very limited number of themes? [E.g. cars, soap operas etc]

[Ref p. 98, No 14]

Marked fascination ☐

4. SPEECH AND LANGUAGE

At least 3 of the following indicated

Appreciation of humour

Does S ever laugh at funny situations or verbal jokes? What makes S laugh? [Ref p. 39, No. 4]

None, or laughs for no reason, or when others laugh ☐

Laughs at slapstick or if people are scolded etc ☐

Laughs at funny sound s, mispronunciations etc ☐

Laughs at verbal jokes but doesn't know why they are funny ☐

Literal understanding

Does S tend to interpret things literally?
[Ref p. 40, No 3]

Frequent ☐

Reciprocal communication

If S communicates in any way is this a two way communication, or is it one sided [on S's terms only], concerning only S's needs and interests? Does S reply with interest and follow the theme of an interchange?

[Ref p. 44, No 2]

Communicates needs only [probably more for AD] ☐

Communicates only on own terms, one-sided, repetitive? ☐

Long winded

Is S formal and long-winded in speech? Does S use speech in a precise, pedantic, literal way? [E.g. insists that a white rose must be called a white, yellow and green rose because of yellow stamens etc]

[Ref p.46, No 7]

Marked ☐

Tone of voice

Does S's voice have normal changes in tone and pitch or does it always stay the same? [Or intonation is present but peculiar, stress on wrong syllables etc ?] The voice may sound mechanical.

[Ref p. 51, No 1]

Marked ☐

Using a different voice

Does S sometimes use a voice that is different from his/her own for no obvious reason? This may or may not be a copy of someone else's voice [Exclude conscious mimicry for a joke etc]

[Ref p. 51, No 2]

Frequently ☐

5. NON-VERBAL COMMUNICATION

At least ONE of the following

Facial Expression

Does S have a wide range of facial expressions? Are these appropriate to the situation?

[Ref p. 52, No 5]

Markedly inappropriate ☐

Or Little or no facial expression ☐

Body language

Does S use NVC {body language - gesture, facial expression, body posture, proximity to others, eye contact, eye pointing etc] inappropriate combination with actions and speech or other method of communication to modulate the social interaction? Is the NVC appropriate or is it odd, inappropriate, clumsy?

[Ref p. 52, No 6]

Markedly inappropriate ☐

Or Uses too little NVC to rate ☐

Stares

Does S make eye contact but stars too long and hard? Does S hold your face to make eye contact and look closely into your eyes? Is eye contact inappropriate?

[Ref p. 55, No 5]

Marked staring or otherwise inappropriate ☐

Sometimes ☐

6. MOTOR CLUMSINESS

At least ONE of the following

Clumsiness

Does S tend to bump into and/or trip over things more than most children of the same age? Does s break things because of clumsiness?

Marked ☐

[Ref p.20, No 2]

Immature gait

Does S walk on a wide base and/or walk or run clumsily to a greater degree than children of the same age?

Marked ☐

[Ref p. 21, No 3]

Poor at games, PE

Is S bad at PE or games because of poor motor coordination? Is this true of all kinds of sport or only team games??

Poor at all sport ☐

[Ref p. 21, No 4]

Hand-eye coordination

Does S play with a ball? Can S throw a ball? Can S catch a ball?
[Ref p. 71, No 2]

Cannot throw a ball at all ☐

Throws a ball indiscriminately ☐

Throws ball fairly accurately ☐

Holds out arms to catch a ball but does so clumsily ☐

Catches a ball clumsily ☐

Clumsy fine motor

How good is S at using fingers and hands, for example when fitting shapes?

Marked clumsiness ☐

[Ref p. 74, No 2]

Abnormal walking

When S is walking, do the movements appear odd – no arm swinging, head bowed etc?

Marked ☐

[Ref p.119, No 7]

APPENDIX E

THEORY OF MIND TESTS

The Sally and Anne Test
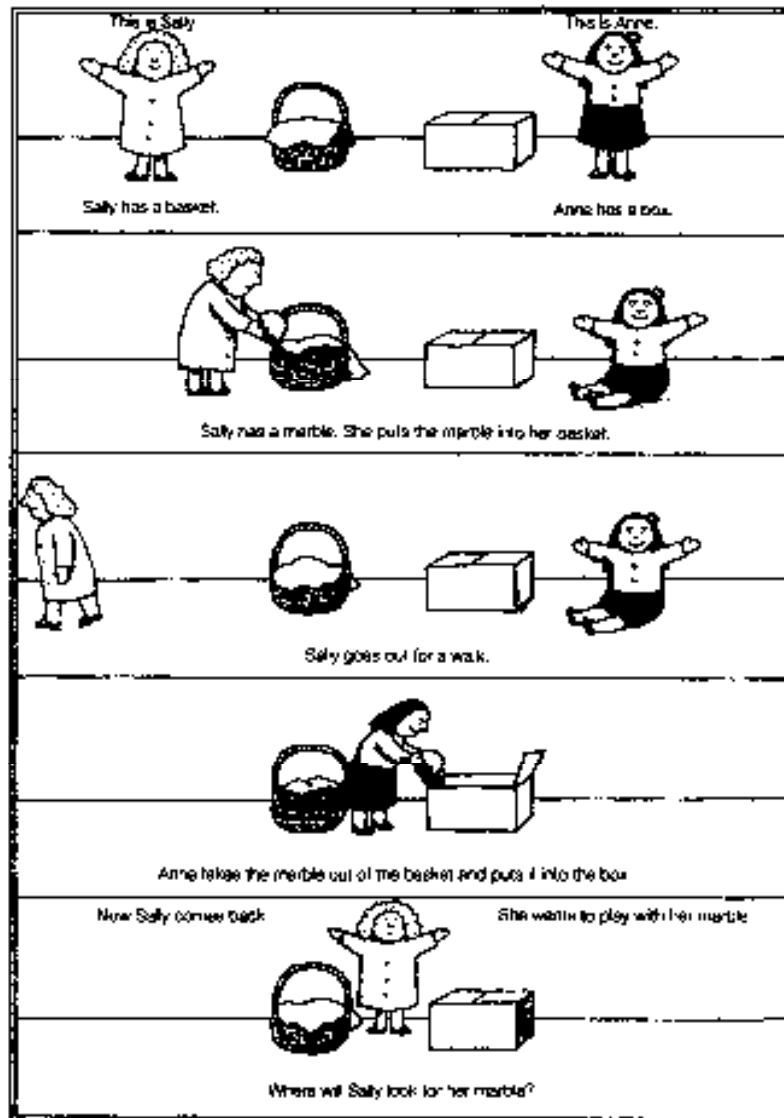
[From *Autism: Explaining the enigma* (2nd ed.) (p. 83), by U. Frith, 2003, Oxford, England: Basil Blackwell.]

The Test Involving the "Banana" Story

Katie and Emma are playing in the house. Emma picks up a banana from the fruit bowl and holds it up to her ear. She says to Katie, "Look! This banana is a telephone!"

Is it true what Emma says?

Why does Emma say this?

The Test Involving the "Picnic" Story

Sarah and Tom are going on a picnic. It is Tom's idea, he says it is going to be a lovely sunny day for a picnic. But just as they are unpacking the food, it starts to rain, and soon they are both soaked to the skin. Sarah is cross. She says, "Oh yes, a lovely day for a picnic alright!"

Is it true, what Sarah says?

Why does she say this?

[From "The Strange Stories Test: A replication with high-functioning adults with autism or Asperger syndrome," by T. Jolliffe & S. Baron-Cohen, 1999, *Journal of Autism and Developmental Disorders, 29*(5), p. 405, from the "Strange Stories" used by F. Happé, "An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped, and normal children and adults," by *Journal of Autism and Developmental Disorders, 24*(2) (1994) 129-154.]

The Test Involving the "Fido" Story

The Hanson family, Mrs Elsie, her husband Gerald and their children, Emma and Dan, have a large, kind, fowl-hunting dog called Fido. Both Emma and her brother Dan are very fond of Fido. Every day Fido sits on the doorstep, looking out for Emma and Dan when they come home from school, and wags his tail when he sees them.

When Emma and Dan's mother was young, she was bitten by a dog. Since then she has never liked dogs, and she is not particularly fond of Fido. Also, she complains that Fido regularly runs after birds in the muddy ground close by.

When the dog isn't outside, it is usually to be found in the kitchen. Elsie has to wash the kitchen floor almost daily. Even though she knows that her husband and her children are fond of the dog, she has several times said to her husband that she would like to get rid of Fido. Her husband is against this, especially because the children are extremely fond of Fido.

Emma has asthma, and suffers sometimes from asthma attacks, generally when she is at school. One day she has an attack and is almost unable to breathe. Luckily, she has her asthma spray in her school bag, so she soon recovers. When her mother hears about this she says to her husband: 'I am quite sure that Emma's asthma attack was caused by an allergy to dogs, and that this is Fido's fault. It is therefore time to get rid of this dog, before it ruins Emma's health!'

Questions

1. What is the Hanson family's dog called?
2. What do Emma and Dan think of Fido?
3. Why does Fido sit and wait for Emma and Dan to return from school?
4. What does Emma and Dan's mother think of dogs?
5. Why does she wash the kitchen floor almost daily? (PI)
Answer: ....
Time: ....
6. What does she want to do with Fido?
7. What do her husband and children think of this?
8. What kind of illness has Emma?
9. What does Emma's mother say to her husband after hearing about Emma's asthma attack at school?
10. Where is Emma when she normally has her attacks?

11. Is Fido normally present when Emma has her asthma attacks?
YES/NO/DON'T KNOW
12. Why does Emma's mother say that Fido is the cause of Emma's asthma attacks, even though she has her attacks when the dog is not present? (MI)
Answer: ....
Time: ....
Prompt: ....

[From "A new 'advanced' test of theory of mind: Evidence from children and adolescents with Asperger syndrome," by N. Kaland, A. Møller-Nielsen, K. Callesen, E. L. Mortensen, D. Gottlieb, & L. Smith, 2002. *Journal of Child Psychology and Psychiatry, 43*(4) pp. 527-528.]

Code: _____

Teacher Survey 1.

1. Have you had a student with Autistic Disorder, Asperger Disorder/Syndrome or any other Autism Spectrum Disorder [ASD] in your class before?

      Yes ☐   No ☐

2. (a) If you have had a student with ASD in your class before do you think it was helpful to know the student's diagnosis?

      Yes ☐   No ☐

   (b) Why or why not?

3. What do you understand is the range of intellectual ability that a student with ASD may have?

4. Please indicate the knowledge you have in regard to ASD in the following areas

   (a) Knowledge about general features of the condition

         None   Some   Much
         ☐   ☐   ☐

   (b) Knowledge about the variation in presentation of the condition of ASD

         None   Some   Much
         ☐   ☐   ☐

(c) Knowledge about specific interventions that may help the
child in an educational context

None	Some	Much
☐	☐	☐

(d) Knowledge about the specific sensory difficulties that
students with ASD may have

None	Some	Much
☐	☐	☐

(e) Knowledge about students with ASD having scattered skills

None	Some	Much
☐	☐	☐

(f) Knowledge about how to change the environment to provide
supportive structures for the student

None	Some	Much
☐	☐	☐

(g) Knowledge about management of specific behaviours

None	Some	Much
☐	☐	☐

5. How have you gained your knowledge about ASD?
   (Tick any that are relevant)

Professional development	☐	Conferences	☐
Books	☐	Television	☐
Radio	☐	Internet	☐
Child with ASD in my class	☐	Other	☐
Personal involvement	☐		

6. (a) Do you feel a need for more specific training in any particular areas?

       Yes ☐   No ☐

  (b) Please outline the areas you feel you need more training in?

7 (a) If you have had a student with ASD in your class did you have access to professional support?

       Yes ☐   No ☐

  (b) If yes, in what specific areas did you have access to professionals?

  (c) Were there any other areas in which you would have liked to have had additional professional support?

       Yes ☐   No ☐

       Please specify the areas.

8. What do you think are the main needs of a student with ASD?

9. (a) Do you feel it is important to modify the classroom
   environment for students who have ASD?

   (b) If you do think so, how do you think this could be done?

   (c) Do you feel you have received enough training about how the
   classroom environment can be modified?

   Yes ☐   No ☐

   Please comment further.

10. Do you think it is important to modify teaching materials for
students   who have ASD?

   Yes ☐   No ☐

   If so, what modifications do you think are important?

11 (a) Have you been able to modify teaching materials for children
with   ASD in the way that you believe is important?

   Yes ☐   No ☐

   Please comment further.

   (b) Have you received any training about how to modify teaching
   materials?

   Yes ☐   No ☐

If yes, please explain more about how you received that training and what it involved?

12. Comment on your experience of whether or not it has made a difference to you in the classroom if a student is supported through the   Disabilities and Impairments Program [DE&T].

13. What do you think are appropriate school options for students who have ASD? [*Please tick options that you consider appropriate and feel free to comment about your choice.*]

Mainstream   ☐

_____

Occasional special classes in mainstream   ☐

_____

 Special school unit within mainstream   ☐

_____

Special Development School   ☐

_____

Special school for students who have ASD   ☐

_____

Some time in mainstream and another venue [specify mixture]   ☐

_____

Other [please specify]

_____

14. (a) Have you found that other teachers have been helpful in supporting you in working with a student with ASD?

        Yes ☐   No ☐

(b) How have other teachers been helpful?

(c) What have you found to be most helpful from your school community?

15 (a) Are you willing to see parents of child with ASD if they request to see you?

        Yes ☐   No ☐

Please comment.

16. (a) How important do you think it is that parents of a child with ASD   have involvement with the child's teacher/s so that they can work   together?   [*Please tick <u>one</u> of the boxes*]

        Not important ☐

        Occasionally important   ☐

        Often important   ☐

        Vitally important ☐

(b) Why did you tick this box?

17. In what areas do you think parents and teachers can collaborate?

18. Any other comments?

APPENDIX G

Code: _____

Teacher Survey 2

1. Do you think it is helpful to know that a student has a diagnosis of ASD?

   Yes ☐   No ☐

   Why or why not?

2. What do you understand is the range of intellectual ability that a student with ASD may have?

3. Please indicate the knowledge you have in regard to ASD in the following areas

   a. Knowledge about general features of the condition

None	Some	Much
☐	☐	☐

   b. Knowledge about the variation in presentation of the condition of ASD

None	Some	Much
☐	☐	☐

   c. Knowledge about specific interventions that may help the child in an educational context

None	Some	Much
☐	☐	☐

d. Knowledge about the specific sensory difficulties that
    students with ASD may have

    None   Some   Much
     ☐   ☐   ☐

e. Knowledge about students with ASD having scattered skills

    None   Some   Much
     ☐   ☐   ☐

f. Knowledge about how to change the environment to provide
    supportive structures for the student

    None   Some   Much
     ☐   ☐   ☐

g. Knowledge about management of specific behaviours

    None   Some   Much
     ☐   ☐   ☐

4. Please comment about your current understanding of specific
    educational interventions that may be helpful for a student with
    ASD?

5. Do you feel that greater access to professional support has been of
    benefit to you as a teacher?

    Yes ☐   No ☐

    Explain how it has been helpful and/or not helpful?

6. What do you think are the main needs of a student with ASD?

7.   (a) Do you feel an ongoing need for more specific training and
      support in any particular areas?

               Yes ☐   No ☐

  (b) If yes, comment on the areas you feel you need more training in?

8. (a) Do you have more ideas now about how the classroom
       environment can be modified to best suit a student with ASD?

               Yes ☐   No ☐

       (b) What ideas about modifying the classroom environment
       have   you gained?

9. (a) Do you have more ideas now about how teaching materials can
       be modified for a student with ASD?

               Yes ☐   No ☐

       (b) What ideas about modifying teaching materials have you
       gained?

10. What do you think are appropriate school options for students who have ASD?

Please tick options that you consider appropriate and feel free to comment about your choice

Mainstream ☐

_____

Occasional special classes in mainstream ☐

_____

 Special school unit within mainstream ☐

_____

Special Development School ☐

_____

Special school for students who have ASD ☐

_____

Some time in mainstream and another venue [specify mixture] ☐

_____

Other [please specify]

11. Has it been of benefit to have had more contact with the child's parent through the project?

Yes ☐   No ☐

Please comment.

12. (a) How important do you think it is that parents of a child with ASD have involvement the child's teacher/s so that they can work together? [*Please tick <u>one</u> of the boxes*]

Not important ☐

Occasionally important ☐

Often important ☐

Vitally important ☐

(b) Why did you tick this box?

13. In what areas do you think parents and teachers can collaborate?

14. What sort of support do you most need from the school environment when working with students with ASD?

15. Any other comments?

APPENDIX H

Parent Survey 1

1 (a) What specific diagnosis has your child been given?

    E.g. Autistic Disorder   ☐

      Pervasive Developmental Disorder   ☐

      Asperger Disorder/Syndrome ☐

      High Functioning Autism   ☐
      Pervasive Developmental Disorder Not Otherwise Specified

  ☐
      Other _____   [please name]

(b) At what age did you find out about your child's diagnosis?

2 (a) Was your child given previous diagnoses before receiving this diagnosis?
   [Please state the diagnosis.]

   (b) Has your child received any other diagnoses in addition to his/her ASD since the diagnosis?

3. What do you believe is the current accurate diagnosis of your child in regard to ASD and additional diagnoses?

4. (a) Do you feel you have enough knowledge about ASD?

      Yes ☐   No ☐

(b) If no, what additional knowledge would you like to have?

5. (a) Has your child had a diagnosis of ASD throughout all of his/her schooling?

      Yes ☐   No ☐

(b) Do you think it is important for the school to have accurate information regarding your child's diagnosis?

      Yes ☐   No ☐

    Please explain why you think this.

6. What has been positive for your child in his/her current school experience up till the present time?

7. What difficulties has your child experienced at school?

8. (a) Is your child eligible for additional support through the Disabilities and Impairment's Program [DE&T]?

      Yes ☐   No ☐

(b) Could you describe the support that your child receives at school?

9. (a) Have you ever wanted to come to the school to see the Principal, Special Needs Support Teacher or the classroom teacher in relation to your child's needs?

    [Please tick a response to each]

    Principal -   Yes ☐   No ☐

    Special Needs Support Teacher - Yes ☐   No ☐

    Teacher -   Yes ☐   No ☐

    (b) Has the school made it easy for you to do this?

    Yes ☐   No ☐

    Please comment.

10. (a) How important do you think it is that parents of a child with ASD have involvement with the child's teacher/s so that they can work together? [*Please tick <u>one</u> of the boxes*]

    Not important ☐

    Occasionally important   ☐

    Often important   ☐

    Vitally important ☐

    (b) Why did you tick this box?

11. (a) Do you feel you have enough involvement with your child's classroom teacher and other teachers who directly work with your child?

   [Please tick a response to each]

     Classroom teacher - Yes ☐   No ☐

     Other teachers -   Yes ☐   No ☐

   (b) What has contributed to the way you feel about involvement with teachers who directly work with your child?

   (c) Could you describe the involvement you have had with the classroom teacher and other teachers who work with your child?

12. (a) Are there any ways in which you would like your child to be further supported at the school?

        Yes ☐   No ☐

   (b) If yes, could you describe the ways in which you would like your child to be further supported?

13. What do you think are appropriate school options for your child? [*Please tick options that you consider appropriate and feel free to comment about your choice.*]

Mainstream ☐

_____

Occasional special classes in mainstream ☐

_____

 Special school unit within mainstream ☐

_____

Special Development School ☐

_____

Special school for students who have ASD ☐

_____

Some time in mainstream and another venue [specify mixture] ☐

_____

Other [please specify]

_____

14. Any other comments?

Code: _____

Parent Survey 2

1   (a) Do you feel you now have more knowledge about ASD?

     Yes ☐   No ☐

    (b) If so, in what areas do you now have more knowledge?

    (c) In what areas do you feel you still need to have more knowledge?

2.   What positive things have occurred for your child at school since the project began?

3.   Does your child have any ongoing difficulties at school?

4. Has it been of benefit to have had greater access to your child's classroom teacher and others involved with your child through the project?

     Yes ☐   No ☐

Please comment.

5. (a) How important do you think it is that parents of a child with ASD have involvement with the child's teacher/s so that they can work together? [*Please tick <u>one</u> of the boxes*]

        Not important ☐

        Occasionally important   ☐

        Often important   ☐

        Vitally important ☐

(b) Why did you tick this box?

6. (a) How have you felt about your involvement with your child's classroom teacher [and other teachers involved with your child] since the project began?

  (b) Why do you think you feel this way?

7. (a) What sort of ongoing support structures at school would you like to see in the future

    i.   For your child

    ii.   For the teacher

    iii.   For yourself?

  (b) Are there any other support structures you would like to see in place?

8. What do you think are appropriate school options for your child? [*Please tick options that you consider appropriate and feel free to comment about your choice.*]

Mainstream ☐

_____

Occasional special classes in mainstream ☐

_____

 Special school unit within mainstream ☐

_____

Special Development School ☐

_____

Special school for students who have ASD ☐

_____

Some time in mainstream and another venue [specify mixture] ☐

_____

Other [please specify]

_____

9. Any other comments?

APPENDIX J

Staff Response to Building the Big Picture

Session led by Lynne Kidman and Janine Bounds

1. (a) Was the whole staff session about 'Building the Big Picture' in relation to a student with Autism Spectrum Disorder relevant to you?

    Yes ☐   No ☐

    (b) How was it relevant?

    (c) What did you gain from the session?

2. (a) Has thinking in terms of the big picture changed your practice for either a student with Autism Spectrum Disorder or a student with any other form of disability?

    Yes ☐   No ☐

    (b) In what ways has it changed your practice?

    (c) Do you think it has changed the practice of other staff?

    Yes ☐   No ☐

    (d) In what ways have you noticed this?

3. (a) Was anything missing from the process that you would have liked more discussion about?

    Yes ☐   No ☐

    (b) Could you explain further?

APPENDIX K

LETTER OF APPROVAL FROM UNIVERSITY

FLINDERS UNIVERSITY
ADELAIDE • AUSTRALIA

Social and Behavioural Research Ethics Committee
Office of Research

GPO Box 2100
Adelaide 5001 Australia

Telephone   (+61 8) 8201 5962
Facsimile   (+61 8) 8201 2035
Email: sandy.huxtable@flinders.edu.au

SBRE 3435

10 March 2006

Ms Janine Bounds
'God's Garden'
375 Mahoneys Ford Road
c/- Post Office
PANMURE Vic 3265

Dear Ms Bounds

Project 3435 _A controlled study of the effects of a structured and collaborative educational intervention in mainstream settings for students with Autism Spectrum Disorder (Asperger Syndrome or High Functioning Autism)_

Further to my letter dated 18 November 2005 I am pleased to inform you that approval of the above project has been confirmed following receipt of the additional information you submitted on 6 March 2006.

Approval is valid for the period of time requested and is given on the basis of information provided in the application, its attachments and the information subsequently provided. In accordance with the undertaking you provided in the application, please inform the Social and Behavioural Research Ethics Committee, giving reasons, if the research project is discontinued before the expected date of completion and report anything which might warrant review of ethical approval of the protocol. Such matters include:

- serious or unexpected adverse effects on participants;
- proposed changes in the protocol; and
- unforeseen events that might affect continued ethical acceptability of the project.

May I draw to your attention that, in order to comply with monitoring requirements of the _National Statement on Ethical Conduct in Research Involving Humans_ an annual and/or final report must be submitted in due course. If a report is not received beforehand, a reminder notice will be issued in twelve months' time. A copy of the report pro forma is available from the SBREC website http://www.flinders.edu.au/research/OfficeofEthics/socialbehavioural.htm .

Yours sincerely

Sandy Huxtable
Secretary
Social and Behavioural Research Ethics Committee

cc: Dr Verity Bottroff, Disability Studies
        Dr Dean Matthews, Disability Studies

NB: If you are a scholarship holder and you receive funding for your research through the National Health & Medical Research Council please forward a copy of this letter to the Head, Higher Degree Administration and Scholarships Office, for forwarding to the NHMRC.

Location: Sturt Road, Bedford Park, South Australia

APPENDIX L

LETTER OF APPROVAL FROM EDUCATION DEPARTMENT

Department of Education & Training

Office of Learning and Teaching

SOS003183

Ms Janine Bounds
375 Mahoneys Ford Road
C/O Post Office
PANMURE 3265

Dear Ms Bounds

Thank you for your application of 3 February 2006 in which you request permission to conduct a research study in government schools titled: *A controlled study of the effects of a structured and collaborative educational intervention in mainstream settings for students with Autism Spectrum Disorder (Asperger Syndrome or High Functioning Autism).*

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principle subject to the conditions detailed below.

1.   Should your institution's ethics committee require changes or you decide to make changes, these changes must be submitted to the Department of Education and Training for its consideration before you proceed.

2.   You obtain approval for the research to be conducted in each school directly from the principal. Details of your research, copies of this letter of approval and the letter of approval from the relevant ethics committee are to be provided to the principal. The final decision as to whether or not your research can proceed in a school rests with the principal.

3.   No student is to participate in this research study unless they are willing to do so and parental permission is received. Sufficient information must be provided to enable parents to make an informed decision and their consent must be obtained in writing.

4.   As a matter of courtesy, you should advise the relevant Regional Director of the schools you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director.

2 Treasury Place
East Melbourne, Victoria 3002
Telephone: +61 3 9637 2000
DX 210083
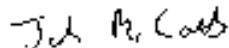
GPO Box 4367
Melbourne, Victoria 3001

Victoria
The Place To Be

5.   Any extensions or variations to the research proposal, additional research involving use of the data collected, or publication of the data beyond that normally associated with academic studies will require a further research approval submission.

6.   At the conclusion of your study, a copy or summary of the research findings should be forwarded to the Research and Development Branch, Department of Education and Training, Level 2, 33 St Andrews Place, GPO Box 4367 Melbourne 3001.

I wish you well with your research study. Should you have further enquiries on this matter, please contact Chris Warne, Project Officer, Research on (03) 9637 2272.

Yours sincerely

John McCarthy
Assistant General Manager
Research and Innovation Division

6 / 3 / 2006

enc

APPENDIX M
LETTER OF INTRODUCTION TO PRINCIPALS

FLINDERS UNIVERSITY
ADELAIDE • AUSTRALIA

Department of Disability Studies
School of Medicine
Faculty of Health Sciences

GPO Box 2100
Adelaide 5001 Australia

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Telephone: (+61 8)8201 3425 (Direct)
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Email: verity.bottroff@flinders.edu.au

Associate Professor Verity Bottroff
Head of Department
Department of Disability Studies
School of Medicine
Faculty of Health Sciences
Flinders University

LETTER OF INTRODUCTION
To school principal

Dear Sir/Madam,

I hold the position of Head of Department of Disability Studies, School of Medicine, Faculty of Health Sciences, at Flinders University and would like to introduce you to Janine Bounds who is a PhD student in this department.

Janine Bounds is undertaking research on the proposed benefits of a four month (sixteen school weeks) project for students in mainstream schools diagnosed as having Autism Spectrum Disorder (Asperger Syndrome or High Functioning Autism). The project aims to build on structures already in place in schools to support students with a disability. Victorian schools have for some time recommended Program Support Group meetings and the formulation of Individual Education Plans for students. Schools have also consulted with additional professionals both within the Department of Education and Training and from outside agencies. The research project that is currently proposed by Janine Bounds builds on these structures and also provides more intensively for four months the following features.

- The opportunity for more whole school learning about Autism Spectrum Disorder from Department of Education and Training staff knowledgeable in Autism Spectrum Disorder. This strand of the project builds on the work already being undertaken by Lynne Kidman (Project worker in the Barwon South West Region determining the specific educational service needs of students with Autism Spectrum Disorder [ASD]).

Location: Sturt Road, Bedford Park, South Australia

- The opportunity for initial general training and ongoing fortnightly support for the classroom teacher of a student with ASD. These sessions would be offered to the classroom teacher, the designated special needs teacher and any teacher aides that may be involved with a particular student. These sessions would initially be generally informative about the range of needs a particular student might have but the ongoing focus of the meetings would be determining appropriate educational interventions to support the student across a range of curriculum domains. Janine Bounds is knowledgeable in the areas of educational interventions for students who have ASD.

    These sessions provide a working support model for the teacher and others involved with the student. Intervention suggestions are decided upon collaboratively, however the ongoing sessions allow for the success of the interventions to be monitored and modified if need be. This kind of ongoing support for teachers is often absent. It is hoped that this ongoing support will provide a better model of supportive training for teachers

- It is also proposed that parents be invited to be involved in the regular fortnightly sessions. This is suggested as part of the collaborative model. Parental involvement offers a range of additional potential benefits. In this way there may be more unity between school and home interventions. As well, parents have an important knowledge base about the functioning of their child that is believed to be helpful in formulating supportive educational interventions

    Before agreeing to take part in the project it is important that it is clear what time commitment is being requested

- The whole school session would involve approximately an hour of staff time.

- The ongoing fortnightly sessions would be held over sixteen school weeks and would last no longer than an hour each session. (There would be nine contact sessions.)

- The classroom teacher would be requested to answer some standardised questionnaires prior to the research beginning and at the end of the four months. These questions relate to the student's executive functioning abilities (planning and organisational skills) and his/her overall behaviour. All questionnaires are undertaken to gain a better knowledge of the student's functioning and to directly feed into knowledge about important areas of intervention support.

It is estimated that the time involved in completing these questions would be one hour and fifty minutes in total pre and post the training and support sessions beginning. These questionnaires can be completed at the teacher's leisure and do not have to be completed in a solid block of time.

- There are two time periods in which the project may take place. The four months (sixteen school weeks) of nine fortnightly sessions may occur during the first half of the year for some students and in the second half of the year for other students. This is determined partly because of the researcher's time constraints and the research design of the project. You will know during term one of the school year if the project can begin in your school in the first or second half year period.

Janine Bounds recognises that involvement in the project requires a considerable time commitment. It is hoped that the knowledge gained and the ongoing support received though will warrant this time investment.

Involvement in the project includes the following steps

a) that the school in general decides to be involved in the project;

b) that individual teachers who have a student with ASD in their class decide whether or not they want to be involved in the project

c) that parent/s of a particular child are informed of the possibility of their involvement in the project

It is important that in each of these steps all parties clearly know that they are free to be involved or not in the project. However, the research can only be undertaken if the school, the individual teacher/s and the parent/s freely agree to be involved. If your school decides to be involved in the project then parent/s could be informed of the possibility of their child's involvement. Interested parents could then discuss the matter further with their school principal and be given further information [Letter of Introduction for parents]. If parents are interested for their child and themselves to be involved then it is also important that they understand their involvement may occur in the first or second half of the year.

It is also important for you to know that any information provided in the course of the project will be treated in the strictest confidence and none of the participants will be individually identifiable in the resulting thesis, report or other publications.

Also it is important to know that even if the school decides to commit to the project the school and/or any of the staff involved in the ongoing sessions are entirely free to discontinue their participation at any time or to decline to answer particular questions in the assessment questionnaires. A summary of results of the project will be made available to you prior to any publications of material.

Janine Bounds would be most grateful if your school decides to take part in the project Permission to conduct this research has also been given by the DE&T Research and Innovation Division.

Further discussion or any other enquires can be had with myself if you would like details of the project to be explained further. I can be contacted at the address given above or by telephone on (08) 82013426, fax (08) 82013646 or

e-mail (Verity.Bottroff@flinders.edu.au).

Thank you for your attention and assistance.

Yours sincerely,

Associate Professor Verity Bottroff (PhD)

APPENDIX N
TEACHER CONSENT FORM

FLINDERS UNIVERSITY
ADELAIDE · AUSTRALIA

Department of Disability Studies
School of Medicine
Faculty of Health Services

GPO Box 2100
Adelaide 5001 Australia

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Telephone: (+61 8)820 . 3726 ;Direct
Facsimile: +61 8)820 3646
Email: verity.bottroff@flinders.edu.au

Associate Professor Verity Bottroff
Head of Department
Department of Disability Studies
School of Medicine
Faculty of Health Sciences
Flinders University

CONSENT FORM FOR PARTICIPATION IN RESEARCH
(Teacher)

My school principal has explained to me details regarding the proposed research project. I understand the time commitment involved in the fortnightly sessions [nine sessions of one hour duration over the sixteen week period]. I also understand that completing assessment/questionnaires pre and post the four months of the project is required. It has been explained to me that completion of these assessment/questionnaires will take approximately two hours and that they can be completed at a time suitable to myself

I _____ give consent regarding my involvement in the research project. Details of requirements and any risks have been explained to my satisfaction.

I understand that I may not directly benefit from taking part in the research. I also understand that I am free to withdraw from the project at any time without disadvantage or repercussions. I am also free to decline to answer particular questions.

Participant's signature _____

Date: _____

I certify that I have explained the research project to the teacher volunteer and consider that he/she understands what is involved and freely consents to participation.

Researcher's name Janine Bounds

Researcher's signature: _____

Date _____

Location: Sturt Road, Bedford Park, South Australia.

APPENDIX O
LETTER OF INTRODUCTION TO PARENTS

FLINDERS UNIVERSITY
ADELAIDE • AUSTRALIA

Department of Disability Studies
School of Medicine
Faculty of Health Sciences

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Adelaide 5001 Australia

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Telephone   (+61 8) 8201 3426 (Direct)
Fassim X   (+61 8) 8201 3646
Email: verity.bottroff@flinders.edu.au

Associate Professor Verity Bottroff
Head of Department
Department of Disability Studies
School of Medicine
Faculty of Health Sciences
Flinders University

LETTER OF INTRODUCTION
To parents

Dear Sir/Madam

I hold the position of Head of Department of Disability Studies, School of Medicine, Faculty of Health Sciences, at Flinders University and would like to introduce you to Janine Bounds who is a PhD student in this department.

Janine Bounds is undertaking research on the proposed benefits of a four month (sixteen school weeks) project for students in mainstream schools diagnosed as having Autism Spectrum Disorder (Asperger Syndrome or High Functioning Autism). The project aims to build on structures already in place in schools to support students with a disability. Victorian schools have for some time recommended Program Support Group meetings and the formulation of Individual Education Plans for students. Schools have also consulted with additional professionals both within the Department of Education and Training and from outside agencies. The research project that is currently proposed by Janine Bounds builds on these structures and also provides more intensively for four months the following features

- The opportunity for more whole school learning about Autism Spectrum Disorder from Department of Education and Training staff knowledgeable in Autism Spectrum Disorder.

- The opportunity for initial general training and ongoing fortnightly support for the classroom teacher of a student with ASD

Sturt East Road, Bedford Park, South Australia

These sessions would be offered to the classroom teacher, the designated special needs teacher and any teacher aides that may be involved with a particular student. These sessions would initially be generally informative about the range of needs a particular student might have but the ongoing focus of the meetings would be determining appropriate educational interventions to support the student across a range of curriculum domains. Janine Bounds is knowledgeable in the areas of educational interventions for students who have ASD. These sessions provide a working support model for the teacher and others involved with the student.

Intervention suggestions are decided upon collaboratively, however the ongoing sessions allow for the success of the interventions to be monitored and modified if need be. This kind of ongoing support for teachers is often absent. It is hoped that this ongoing support will provide a better model of supportive training for teachers.

- It is also proposed that parents be invited to be involved in the regular fortnightly sessions. This is suggested as part of the collaborative model. Parental involvement offers a range of additional potential benefits. In this way there may be more unity between school and home interventions. As well, parents have an important knowledge base about the functioning of their child that is believed to be helpful in formulating supportive educational interventions.

The school your child attends has already agreed to be part of this research project. Janine Bounds would be most grateful if you and your child would like to participate in this project, however before agreeing to take part in the project it is important that it is clear what time commitment is being requested of yourself and your child.

The following would be required for yourself.

- Involvement in the ongoing fortnightly sessions (nine contact sessions) that would be held over the sixteen week period. Each session would last no longer than an hour. There are two time periods in which the project may take place. The four months (sixteen school weeks) of nine fortnightly sessions may occur during the first half of the year for some students and in the second half of the year for other students. You will know during term one of the school year if the project can begin in your school in the first or second half year period.

- Prior to the commencement of the project there would be assessment of your child's needs. This would involve discussion with Janine Bounds about your child's developmental history and current behaviours. This would take approximately two hours. Also at your leisure two other questionnaires and a brief survey would be completed that would take approximately one hour and twenty minutes in total. This assessment is intended to directly help with the interventions and support to be put in place for your child in the school setting. At the end of the four month period a briefer time of discussion with Janine Bounds will also be required (thirty minutes) and the completion of a questionnaire and survey (fifty minutes).

If your child participated in the first intervention group then a brief follow up (thirty minutes) four months after the fortnightly sessions were completed may also occur.

The following would be required for your child

- Prior to the commencement of the research project your child will undertake an intellectual assessment (one and a half hours to two hours). This will not be necessary if your child has had an intellectual assessment done relatively recently.

- Further specific academic assessment (thirty-five minutes) will also be required before the start of the four month period.

- After the four month period some of these assessments will be repeated (thirty five to fifty-five minutes)

All assessments are age appropriate for your child and the assessment tools are well recognised and standardised.

Janine Bounds recognises that involvement in the project requires a considerable time commitment. It is hoped that the knowledge gained, enjoyment in the collaboration with school staff and benefits for your child will warrant this time investment.

It is also important for you to know that any information provided in the course of the project will be treated in the strictest confidence and none of the participants will be individually identifiable in the resulting thesis, report or other publications. However, information gained in assessment that is relevant to supporting your child in the school setting may be disclosed at the fortnightly meetings in which interventions are discussed. This will only occur though if there is parental agreement.

In addition, all participants at the fortnightly meetings will need to know that information cannot be disclosed to parties outside the meeting unless parental permission is given. A summary of results of the project will be made available to you prior to any publications of material.

It is important for you to also know that even if you decide to commit to the project you are entirely free to discontinue your participation at any time or to decline to answer particular questions in the assessment questionnaires.

Janine Bounds would be most grateful if you and your child decide to take part in the project. Janine Bounds has already made contact with your school principal and is formally introduced to him/her.

Further discussion or any other enquires can be had with myself if you would like details of the project to be explained further. I can be contacted at the address given above or by telephone on (08) 82013426, fax (08) 82013646 or e-mail

(Verity.Bottroff@flinders.edu.au).

Permission to conduct this research has been given by the Research and Innovation Division of the Department of Education and Training in Schools (Victoria) as well as the Social and Behavioural Research Ethics Committee at Flinders University.

Thank you for your attention and assistance.

Yours sincerely,

Associate Professor Verity Bottroff (PhD)

APPENDIX P

PARENT CONSENT FORM

FLINDERS UNIVERSITY
ADELAIDE • AUSTRALIA

Department of Disability Studies
School of Medicine
Faculty of Health Sciences

GPO Box 2100
Adelaide 5001 Australia

Telephone (+61 8) 8201 3745 (Dept)
Telephone (+61 8) 8201 3426 (Direct)
Facsimile (+61 8) 8201 3646
Email verity.bottroff@flinders.edu.au

Associate Professor Verity Bottroff
Head of Department
Department of Disability Studies
School of Medicine
Faculty of Health Sciences
Flinders University

CONSENT FORM FOR PARTICIPATION IN RESEARCH
(Parent)

I .... give consent for my child to participate as requested in the Letter of Introduction in the research project. It has been explained to me that the project involves the participation of my child and myself in the suggested structured and collaborative educational intervention.

1. I have read the information provided.
2. Details of procedures and any risks have been explained to my satisfaction.
3. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
4. I understand that
   - I may not directly benefit from taking part in this research
   - I am free to withdraw from the project at any time and am free to decline to answer particular questions.
   - While the information gained in this study will be published as explained, both my child and myself will not be identified by name, and individual information will remain confidential.
   - Whether I participate or not, or withdraw after participating, that this will have no effect on any treatment or service that is being provided for my child.
5. I have had the opportunity to discuss taking part in this research with the school principal.

Participant's signature...Date.......................

I certify that I have explained the research project to the parent volunteer and consider that she/he understands what is involved and freely consents to participation.

Researcher's name...

Researcher's signature...Date.....................

Flinders: Sturt, Bedford Park, South Australia

APPENDIX Q

Basic Guidelines about the use of

Language

with a student who has ASD

One talks to a learner with autism at the same times and for the same reasons as someone who does not have autism BUT there are also some helpful accommodations.

- *Talking works best when stress is at a low level*

When to STOP talking

- *When stress is at a high level.*

The addition of extra auditory stimulation is not useful when stress is high.

- *After asking a question or giving a direction that requires a verbal or motor response.*

The learner needs extra time to process auditory information and produce a response. Stop talking and wait calmly but expectantly [for at least 30 seconds] before repeating.

Four Guiding Principles

1. Get the learner's attention and use precise language
2. Speak softly and clearly. [In normal situations yelling is not ever appropriate. Yelling is aggressive and the student can copy the same language style. In a dangerous situation one would speak louder and with more emphasis.]
3. Provide visual support. [Draw pictures, write words or point to the learner's visual communication system (if available) while speaking.]
4. Use vocal emphasis to highlight important words

How to get attention

- The speaker needs to be at eye level
- *In group situations* – get attention by making sure the leaner understands the meaning of words. Words such as 'everyone, class etc' don't clearly convey who you mean. Similarly saying 'Line up' does not clearly say who is to line up. Say the student's name.

How to use precise language

- Express a complete thought

Ineffective: Find your coat

Learner's perspective: Which coat?

Effective: Put on your red coat

- Be specific

Ineffective: Put it away

Learner's perspective: What do I put away?

Effective: Pick up your toy truck and put it in the box

- Tell the learner what to do

Ineffective: Don't get out of that chair

Learner's perspective: I'll have to stay in this chair always. OK I'll stand up.

Effective: Sit in the chair until we finish eating.

Ineffective: Stop. Keep your hands to yourself.

Learner's perspective: How do I keep my hands to myself?

Effective: 'Walk quietly to the library with your hands in your pockets' or 'Carry these books to the library'.

- Leave out words that don't carry meaning

Ineffective: 'Would you…..?', 'I would like you to……', 'Don't you know the dog is hungry?'

Effective: It's time to feed the dog. He will be hungry.

- State a contingency positively not negatively

Ineffective: If you don't wipe the table you can't go home

Learner's perspective: Oh no! Can't go home! [Such a statement may lead to crisis]

Effective: When you wipe the table you can go home.

- Try to avoid negative instructions

Ineffective: Don't throw your book

Learner's perspective: The student has difficulty processing the negative – the child actually hears 'throw your book'

Effective: Put your book on your desk

- Ask questions only when there are real choices

Ineffective: Are you ready to work?

Learner's perspective: Oh good! I have a choice!

Effective: It will be time to work when the bell rings

Bloopers!

1. Sometimes people think they are giving a command when they are not.

Think about these statements:

- Would you come here?
- I want you to sit down.
- Go over there – OK?

None of these are actually commands.

2. Also note how a preparatory statement like 'It's time for maths' does not really tell the student what to do. One needs to say 'It's time for maths. Joshua here's your maths sheet to do'.

3. Do not use emotional blackmail
'Do it for me…'

4. Target behaviour not the student
Say 'I don't like what you <u>did</u>. [Then tell the student what they should have done].'

[Based on information in *Understanding the Nature of Autism* (Janzen, 2003)]

APPENDIX R

Results of Calculations Using Tukey's Honestly Significant Difference (HSD) Formula When Results of One-way Repeated Measures ANOVAs Comparing Group Two's Rated Disco Items Scores Across Time 1, Time 2 and Time 3 were Significant

Formula for Tukey's HSD = $q \sqrt{\dfrac{MS_{error}}{n}}$

Rated Disco Items sub-domain or domain	HSD	Mean difference between Time 1 and Time 2	Mean difference between Time 2 and Time 3
Toilet Training[a]	-		
Feeding[a]	-		
Dressing[a]	-		
Hygiene[a]	-		
Self-Care domain	1.11	0.56	1.78*
Receptive Communication[a]	-		
Expressive Communication	0.98	0.49	1.66*
Non-verbal Communication[a]	-		
Communication domain	1.04	0.69	1.90*
Social Interaction With Adults	1.60	0.12	2.92*
Social Interaction With Age Peers	1.26	0.22	1.78*
Social Play[a]	-		
Social Interaction domain	2.29	0.46	5.20*
Stereotyped Movements and Vocalisations[b]	0.13	0.084	0.15*
Responses to Proximal Stimuli[a]	-		
Responses to Auditory Stimuli[a]	-		
Responses to Visual Stimuli[a]	-		
Routines and Resistance to Change[a]	-		
Emotions[a]	-		
Overall Pattern of Chosen Activities[a]	-		
Repetitive, Stereotyped Activities domain[c]	0.009	0.004	0.018*
Behaviour Without Social Awareness	1.53	0.33	2.00*
Behaviour With Social Awareness[a]	-		
Sleep Disturbances[a]	-		
Maladaptive Behaviour domain	1.56	0.44	2.00*
Total Rated Disco Items	4.82	4.79	18.7*

Note. $n = 9$; Total Rated Disco Items includes *Other* sub-domains
[a] Significance NOT indicated in one-way repeated Measures ANOVA
[b] Data transformed by square root
[c] Data transformed by logarithm
* Items with a significance level < .05

APPENDIX S

Results of One-way ANCOVAs Comparing Changes in Group One Students'
Rated Disco Items Scores from Time 1 to Time 2 with Group Two Students' Rated
Disco Items Scores from Time 2 to Time 3

Rated Disco Items sub-domain or domain	*F*	*p*
Toilet Training[a]	0.004	.952
Feeding	2.074	.170
Dressing	0.849	.371
Hygiene	0.100	.756
Self-Care domain	1.093	.312
Receptive Communication[b]	4.469	.052
Expressive Communication	0.460	.508
Non-Verbal Communication	0.120	.734
Communication domain	0.499	.491
Social Interaction With Adults	0.848	.372
Social Interaction With Age Peers	1.003	.332
Social Play	0.451	.512
Social Interaction domain	0.089	.770
Stereotyped Movements and Vocalisations[c]	4.139	.060
Responses to Proximal Sensory Stimuli	0.254	.621
Responses to Auditory Stimuli[a]	1.507	.239
Responses to Visual Stimuli[a]	0.485	.497
Routines and Resistance to Change	6.214	.025*
Emotions	0.018	.895
Overall Pattern of Chosen Activities[a]	0.007	.933
Repetitive, Stereotyped Activities domain[b]	0.419	.527
Behaviour Without Social Awareness	0.365	.555
Behaviour With Social Awareness[c]	1.540	.234
Sleep Disturbances[a]	0.022	.885
Maladaptive Behaviour domain	0.083	.777
Total Rated Disco Items	0.058	.813

Note. Group One, *n* = 9; Group Two, *n* = 9; Total Rated Disco Items includes *Other*
sub-domains

[a] Scores not normally distributed (Shapiro-Wilks statistic *p* < .05)

[b] Results after logarithmic transformation of data to achieve normality

[c] Results after square root transformation of data to achieve normality

* *p* < .05

APPENDIX T

Results of One-way ANCOVAs Comparing Changes in Rated Disco Items Scores of Students in Each Autistic Diagnostic Category from Start to End of Implementation of Research Model

Rated Disco Items domain	F	p
Self-care	0.942	.413
Communication	1.239	.320
Social Interaction[a]	1.164	.341
Repetitive and Stereotyped Activities	0.698	.514
Maladaptive Behaviour	1.205	.329
Total Rated Disco Items	1.412	.276

Note . Autistic Disorder, $n = 7$; Asperger's Disorder, $n = 7$; Autistic Spectrum Disorder – Not Otherwise Specified, $n = 4$; Total Rated Disco Items includes *Other* sub-domains

[a] Scores not normally distributed (Shapiro-Wilks statistic $p < .05$)

APPENDIX U

Results of SPANOVAs in Relation to BRIEF Teacher Form T Scores of Students in Each Autistic Diagnostic Category and in Whole Sample Before and After Implementation of Research Model

BRIEF Teacher Form clinical scale or composite	Effect	Wilks' Lambda	*F*	*df* *(hyp)*	*df* *(error)*	*p*
Inhibit	Time	.936	1.024	1	15	.328
	Time*Diagnosis	.958	0.332	2	15	.723
	Diagnosis		3.335	2	15	.063
Shift	Time	.998	0.029	1	15	.867
	Time*Diagnosis	.960	0.311	2	15	.737
	Diagnosis		0.207	2	15	.816
Emotional Control	Time	.999	0.014	1	15	.906
	Time*Diagnosis	.993	0.055	2	15	.947
	Diagnosis		0.389	2	15	.684
Behaviour Regulation Index	Time	.995	0.082	1	15	.779
	Time*Diagnosis	.971	0.223	2	15	.803
	Diagnosis		1.326	2	15	.295
Initiate	Time	.932	1.092	1	15	.313
	Time*Diagnosis	.985	0.117	2	15	.890
	Diagnosis		0.360	2	15	.704
Working Memory	Time	.919	1.313	1	15	.270
	Time*Diagnosis	.978	0.168	2	15	.847
	Diagnosis		2.239	2	15	.141
Plan/Organise	Time	.825	3.181	1	15	.095
	Time*Diagnosis	.965	0.272	2	15	.765
	Diagnosis		0.154	2	15	.859
Organisation of Materials	Time	.959	0.640	1	15	.436
	Time*Diagnosis	.962	0.298	2	15	.747
	Diagnosis		1.708	2	15	.215
Monitor	Time	.983	0.265	1	15	.614
	Time*Diagnosis	.939	0.487	2	15	.624
	Diagnosis		4.522	2	15	.029*
Metacognition Index	Time	.906	1.551	1	15	.232
	Time*Diagnosis	.966	0.263	2	15	.772
	Diagnosis		1.552	2	15	.244
Global Executive Composite	Time	.944	0.884	1	15	.362
	Time*Diagnosis	.981	0.142	2	15	.869
	Diagnosis		1.753	2	15	.207

Note. Autistic Disorder, *n* = 7; Asperger's Disorder, *n* = 7; Autistic Spectrum Disorder – Not Otherwise Specified, *n* = 4; Whole sample, *n* = 18

*p < .05

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