ASPERGER'S SYNDROME:

CLASSROOM SUPPORT AND UNDERSTANDING

BY

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A Thesis
Submitted to the Faculty of Graduate Studies
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Abstract

Individuals diagnosed with Asperger's syndrome experience difficulties in the areas of (1) social interaction, (2) communication, (3) imagination and flexibility of thought, and (4) motor skills. Educators interacting with students with Asperger's syndrome need to understand the characteristics of the disorder and the impact these characteristics have on student behaviour. Without an appreciation of Asperger's syndrome, teachers may become impatient and/or frustrated.

This study reported on a literature review, including the history, characteristics, theories and identification of Asperger's syndrome, and then related these to literacy development. A case study focused on one student, within a small group of four, and emphasized the reading and writing of informative text through instruction in note-taking, including the selection of main ideas and supporting details based on the structures in social studies texts. Narrative inquiry examined the techniques that enable a child with Asperger's syndrome to organize and comprehend content area materials and learn from text.

Findings showed that the student mastered outlining as a technique for note-taking. He demonstrated marked improvement both in verbal and writing ability, self-confidence, social development and metacognitive knowledge

The study identified teaching strategies that support a student with Asperger's syndrome, recommended short and long term goals for this particular student and demonstrated the efficacy of reflective teaching. It serves as an

inspiration to teachers who provide educational programming for students with Asperger's characteristics.

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CHAPTER 1

INTRODUCTION

People with Asperger's syndrome have pervasive impairments in the areas of social interaction and communication, as well as unusual, restricted patterns of behaviours and perseverative interests. Their conditions are permanent and the difficulties they experience in school, at home and in the community are both significant and extensive. Understanding this condition is critical in meeting the educational needs of students with Asperger's. Without understanding the impairments, teachers could easily assume that such students are willful, stubborn, rude, irritable, socially inept and perhaps not very intelligent. While some of these observations may be accurate, they do not provide a complete picture of the student and his/her ability to learn. Neither do they facilitate the empathy or open-mindedness required to teach these students effectively. Without flexibility and a willingness to learn what students with Asperger's syndrome experience, teaching could become a frustrating, year-long battle.

An understanding of such a condition, foreign to most people, does not come easily. Taking the time to reflect on the perceptions, interests, values and ways of thinking that individuals with this diagnosis experience is critical since actually experiencing such a condition is physically impossible. However, in-depth investigations of a participant's perceptions and reactions to experiences can lead to a clearer understanding of the world experienced by an individual with Asperger's syndrome. This increased understanding, combined with sound

educational plans and interventions, can establish successful experiences for all, both at school and at home. For readers not familiar with Asperger's syndrome, a brief vignette exemplifying the characteristic behaviours of Asperger's syndrome may clarify the nature of this disorder. Thus, a brief fictional case is included in Appendix A.

Purpose of the Study

The primary purpose of this study is to document the teaching and learning of one teenage student with Asperger's syndrome. Through this documentation and a literature review, I hope to help educators understand Asperger's syndrome and its diagnosis and, more importantly, develop a measure of empathy for those with this syndrome. Early identification and appropriate educational interventions can help these students feel comfortable in school and make the most of their educational opportunities. Awareness of the learning styles and thinking patterns of students with Asperger's syndrome can help teachers develop strategies that will enhance their learning.

First, the history and the current medical and therapeutic information regarding Asperger's syndrome is explored. This information establishes the nature of the condition, its characteristics, prevalence, treatment and the criteria prescribed for diagnosis. Next, themes essential to adolescent literacy development are reviewed. Considerations to develop skills in reading comprehension, writing, remembering and metacognition in teenage students are described. Comparing the characteristics of Asperger's syndrome to the requirements for effective adolescent literacy instruction provides themes and

strategies for teaching. Finally, an actual case study that documents an instructional intervention with an adolescent with Asperger's syndrome is presented.

Case Study Rationale

Such a single case study, while not reflective of a larger group, will provide: (1) a better understanding of the condition known as Asperger's syndrome, and (2) a useful instructional approach for enhancing the ability of such students to learn from text. The perceptions and experiences of this adolescent, written in a narrative format, will help the reader to understand how Asperger's syndrome filters and alters the student's experiences. This is particularly important as medical experts in this field believe that individuals with Asperger's syndrome think in unusual ways (Volkmar, Klin, Schultz, Bronen, Marans, Sparrow & Cohen, 1996). In fact, Volkmar and his colleagues have reported that Magnetic Resonance Imaging has shown physical differences in the brains of such individuals. The case study will simulate the walk of ' a mile in another man's shoes'. Such a phenomenological format most effectively helps the reader to appreciate the life of another; and more importantly serves as a model for other educators to consider.

Research Procedures

Outlining the procedures involved in this study requires the clarification of a number of points, such as the steps involved in narrative inquiry, my role as the investigator, the case study selection process and the nature of the setting.

Narrative Inquiry

In this study, I use a phenomenological approach to research, specifically narrative inquiry. Narrative study uses "stories" to reconstruct experience. "Narrative and life go together and so the principal attraction of narrative as method is its capacity to render life experiences, both personal and social, in relevant and meaningful ways" (Connelly & Clandinin, 1991, p. 141). Narration can foster understanding and empathy in the reader. It is a method of research that is particularly well suited to studies related to education, feminism, and other social sciences.

Narration will be used to reflect upon the decisions I made as a teacher in responding to the needs of the group generally and the student with Asperger's specifically. Whereas testing of a specific intervention provides information about the effectiveness of that particular intervention with regard to the specific students tested, this approach encompasses more variables, such as motivation, behaviours, rate of learning, environment, as well as the efficacy of the strategies implemented. Task analysis and teacher decision-making are included; results are not limited to student responses. The approach could be considered analogous to the work of most teachers. Narration is more realistic than the statistical analysis of a single intervention and more inclusive of the vast number of factors that affect learning in a variety of settings.

Hopefully, teachers will find the inclusion of analytic decision-making reaffirming in regard to the complex challenges that occur every day in an inclusive classroom. The strategies chosen and the decisions made with respect

to supporting the student with Asperger's syndrome may make those same processes easier for teachers who might also encounter such students.

Procedures of Narrative Inquiry

Connelly and Clandinin (1991) described a number of components to narrative research. First, the voice of both the researcher and the practitioner must be present. In this case, the student's voice was presented through assessment results, behavioural descriptions and anecdotes, verbal responses and work output. As the researcher, my voice was reflected through the selections of vignettes and through my analysis of our shared experiences.

Next, empirical data must be collected. The data for this case study consisted of test results, work samples, lesson plans and anecdotal observations/comments.

Then the data must be analyzed. I searched for themes and patterns. I compared the results of the instruction to the results of the other students whom I also teach. I consulted regularly with other professionals, in particular our school psychologist and reading clinician, my faculty advisor, the teaching assistants, treatment staff and the group's homeroom teacher. I compared the accomplishments of the student with Asperger's to the learning and behavioural patterns suggested by the academic and medical literature. I also considered instructional context features, such as the classroom environment, interactions with others, time constraints and sequence of events.

Finally, the narrative was written or reconstructed. This required the selection of data and plots that best encapsulated the situation. Rather than a

summary, I selected key features that were reflective of the overall story to represent the experiences of the student and myself.

Selecting the Participant

The participant was a client at a Canadian, mid-western mental health treatment center that services twelve to eighteen year old youths. This center admits individuals who are unable to function successfully within their communities. Many students with Asperger's and Pervasive Developmental Disorder, Not Otherwise Specified (PDD-NOS), exist within the public school system, but may not be identified, beyond being labeled 'odd', or 'nerdish' or 'difficult'. While attending this center, clinical treatment teams, including psychiatrists, diagnose and treat individuals with significant mental health difficulties. A student with Asperger's in this setting frequently displays extreme behaviours, and has been diagnosed. Either the student's behaviour was unmanageable in the home school setting leading to a subsequent referral to the treatment center, or the educators working with the student were too rigid to be able to accommodate the student. Such a student is more likely to display a broader and a more significant range of unusual thinking than a child with only a mild or minimal number of Asperger's characteristics.

Selecting an adolescent was convenient in terms of choosing a fairly readily available participant; but more importantly, such an adolescent, while still engaged in the school system, might be more articulate than a younger child. An older child has also had time to amass more experiences and perhaps to encounter some of the frustrations that accompany adolescence and the

demands of schooling.

While receiving treatment, students attended school for about half of each day. As a resource teacher, I worked with a group of four male adolescents for three days per week for much of the 2000-2001 school year. Their ages ranged between 13 and 15 years of ages and their grade placements between grade 7 and Senior 1 (grade 9). They displayed a variety of mental health related behaviours as well as learning disabilities. Each of these students displayed academic deficits in addition to deficiencies in social skills. Two of the students were diagnosed with PDD-NOS. I used only one as a case study.

Originally, the homeroom teacher requested that I help these boys develop their writing skills. We arranged for me to work with this group for three sessions per week, 45 minutes per session. Mid-school year I was assigned a practicum for a clinical reading course I was completing at the University of Manitoba. I was to assess several students, implement a teaching strategy to address a learning need and record the lesson plans, student progress and make personal observations. For this assignment I chose to record the work being done by this same group of boys. Later, my advisor suggested that the data that I had been collecting could be used for the thesis I was also writing. The thesis topic I had chosen was Asperger's syndrome.

I decided to revise my thesis. I had previously chosen to use a narrative case study approach, but had not developed a specific intervention. If the parent(s) agreed, I would be able to incorporate the work by the student with Asperger's into the thesis.

I contacted the father of this teenager over the telephone and explained the nature of my thesis. I introduced the study, including an overview of the purpose, procedures and product of the research to the parent. He thought the project had merit and agreed verbally to his son being included in the case study. I followed up this conversation with a letter paraphrasing the same information and requesting written consent, which I received. The university and school district ethics/research committees also granted consent for the study. In order to preserve the student's privacy, I decided to use a pseudonym—Jeff.

My Roles

I assumed several roles during this study. First and foremost, I was the resource teacher. In that capacity, I worked with a small group of four teenage boys for three 45-minute classes per week. They shared a variety of learning difficulties and all of them displayed particular difficulties in the area of writing. I shared information from these sessions with the homeroom teacher and with the treatment staff. Second, I was a graduate level university student, recording and analyzing my work as an assignment for the course I was completing. Third, I was a researcher, investigating effective strategies to improve the reading and writing skills of such students. The blending of these roles allowed me to incorporate the completed research into this study.

The Setting

The school associated with the treatment center occupies one wing of the hospital. Its mandate is to provide educational services to children receiving treatment.

Jeff, the teenager, and his parents were reasonably comfortable in the treatment center/school setting. Jeff had participated in treatment and educational activities throughout the building and his parents had had numerous meetings with treatment and school staff while he attended the facility.

The particular classroom that we used was small and crowded with a variety of books, materials, desks, assorted chairs, furniture and computers. This stimulating environment was not ideal for students who possess either attention or organization difficulties; however, no other reasonable spaces were available.

Fortunately, one and sometimes two teaching assistants helped support this group of boys. Both of these teaching assistants had worked in this setting for over ten years and were accustomed to working with students with learning disabilities and mental health issues.

The narration begins with a general description of the group dynamics and the work carried out prior to the introduction of note-taking, which became the theme or focus of intervention. My rationale for teaching specific note-taking techniques is included. Other topics include a description of Jeff, the student--his strengths, limitations and background; plus, the effects of both student interactions (the social environment) and the physical environment. The successes and failures of various tasks on various days are also analyzed. I conclude with recommendations for future work with this particular student and for approaches to use in teaching students with Asperger's generally.

Terminology

In 1994, Asperger's disorder was added to the Diagnostic and Statistical Manual of Mental Disorders, 4th Ed, commonly known as the DSM-IV (1994). The DSM-IV-TR (2000) primarily uses the term "disorder" but adds that "syndrome" is equally acceptable. As much of the current literature also uses the term "syndrome," that is the term that I have used in this study. The DSM-IV is a manual generally used in Canada and much of the world to identify mental health conditions. In 1989, the World Health Organization (WHO) also developed criteria for diagnosing Asperger's syndrome. (Diagnostic criteria for Asperger's syndrome developed by the APA, 1994; the WHO, 1993; Gillberg & Gillberg, 1989; and Szatmari, Bremner and Nagy, 1989, can be found in Appendices B through E.) Despite these fairly recent references compiled by the American Psychiatric Association (1994) and the WHO (1992), Asperger first identified the disorder in 1944.

There is a general consensus that Asperger's syndrome is related to Autism. Controversy has existed as to the differentiation of high functioning Autism (HFA) and Asperger's syndrome. Ozonoff, Rogers, and Pennington (1991) believe that children with Asperger's are different from children with HFA, despite common characteristics of normal intelligence, communication deficits, social reciprocity deficits and stereotypical behaviours. Rosenn (2001) states that children with HFA are usually slower to develop language skills and display stronger visual-spatial skills than children with Asperger's. Individuals with Asperger's score higher on the verbal than the performance components of

intelligence tests; whereas, individuals with HFA display stronger results on the performance tests than the verbal tests (Rosenn, 2001). Tanguay (2000) reports similar differentiation based on both language acquisition and discrepancies between performance and verbal intelligence quotients. He also reports inconclusive research in differentiating between HFA and Asperger's on the basis of motor skills, intelligence or degree of social deficits. "It is not clear whether HFA is simply a less functional grouping on the spectrum, or whether the categories are parallel, along with other, as yet [undefined] high functioning [Pervasive Developmental Disorder] PDD groups" (Rosenn, 2001, p. 3).

Both Asperger's syndrome and HFA can be differentiated from the more general Autistic Disorder. Individuals with Autistic Disorder display delayed language acquisition and delayed cognitive development (DSM-IV-TR, 2000). Also, the social deficits associated with Asperger's are evidenced by a lack of reciprocity or being one-sided and eccentric when interacting with others; whereas, the social handicaps associated with Autistic Disorder are reflected by withdrawal and indifference.

> Furthermore, in Autistic Disorder, restricted, repetitive, and stereotyped interests and activities are often characterized by the presence of motor mannerisms, preoccupation with parts of objects, rituals, and marked distress in change, whereas in Asperger's Disorder these are primarily observed in the all-encompassing pursuit of a circumscribed interest involving a topic to which the individual devotes inordinate amounts of time amassing information and facts (DSM-IV-TR, 2000, p.82).

Another term, frequently associated with Asperger's syndrome is Pervasive Developmental Disorder (PDD). In fact, Autism, HFA and Asperger's syndrome are encompassed by the term PDD. The DSM-IV (1994) has included

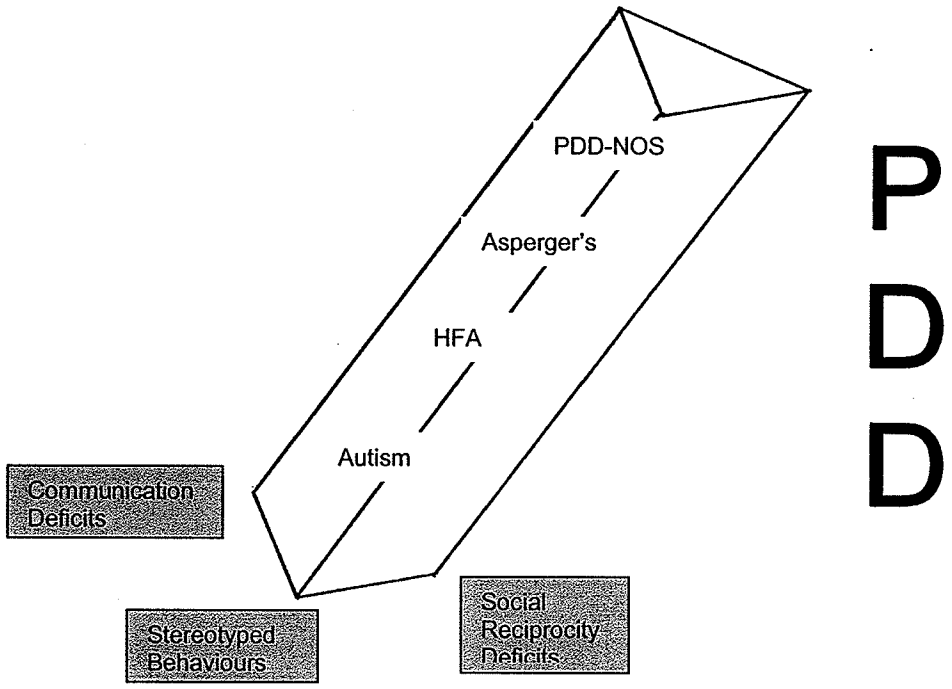
five diagnoses under the PDD umbrella: autism, Rett's disorder, childhood disintegrative disorder, Asperger's syndrome, and pervasive developmental disorder not otherwise specified (PDD-NOS; Tanguay, 2000). 'Not otherwise specified,' or NOS, frequently follows a PDD designation. PDD-NOS is a diagnosis generally reserved for those individuals who display some, but not all, of the essential characteristics and qualities of Autism or Asperger's syndrome (Szatmari, 1991, Kiln & Volkmar, 1997). In addition, PDD-NOS can be used as "a 'default' diagnosis. . . when information is inadequate or as a last resort when the developmental history is unreliable" (Towbin, 1997). Frequently, adults who work with such individuals neglect to add the NOS addendum in conversations. So, in actual usage, PDD may refer to those individuals who exhibit some, but not all, of the qualities ascribed to children with Asperger's or Autism.

The two diagrams on the following pages represent simplified models of the two theories presented above—a parallel model of diagnosis and a continuum model of diagnosis. Both models reflect a common base of shared characteristics. Both models have also omitted other related diagnoses.

To make diagnoses more difficult, individuals with PDD may display characteristics of other disorders as well. These may include obsessive-compulsive disorder, attention deficit hyperactivity disorder, Tourette's disorder, depression, social phobia, anxiety disorders, language disorders or cerebral palsy (DSM-IV-TR, 2000; Attwood, 2000). In addition, differentiating between Asperger's syndrome and schizoid personality disorder is also quite difficult. "In general the social difficulties in Asperger's Disorder are more severe and of

earlier onset" (DSM-IV-TR, 2000, p.83); however, as individuals may display a

Continuum Model of Diagnosis



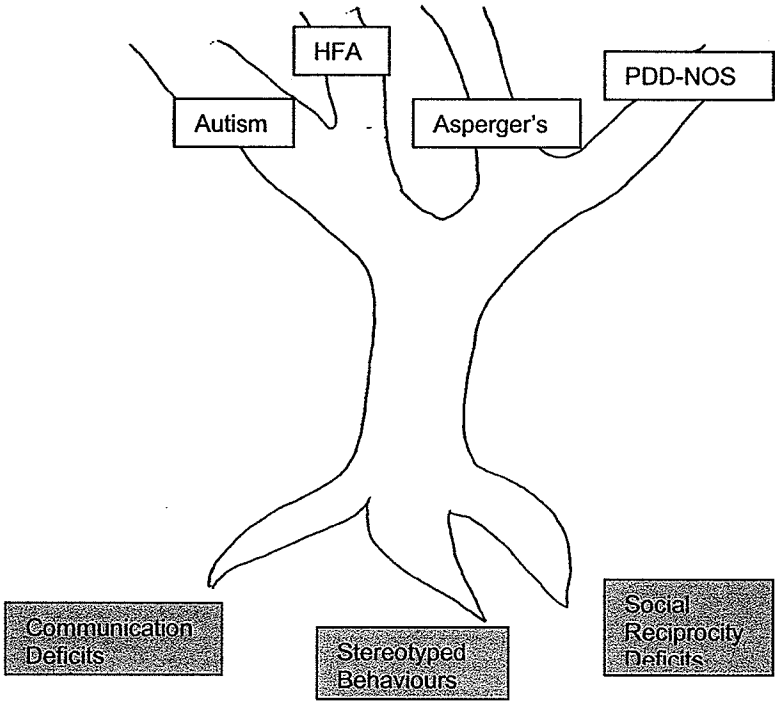
(Adapted from Rosenn, 2001 and Tanguay, 2001.)

range of deficits and degrees of impairment, selecting the most appropriate diagnosis is a challenge for doctors.

Another term often associated with Asperger's syndrome is Nonverbal Learning Disability (NVLD or NLD). Although this term is not included in the DSM-IV, other literature relating to NVLD frequently applies to students with Asperger's syndrome and can offer teachers and parents additional valuable information. Asperger's syndrome is only one of numerous disorders included in NVLD. Since some individuals use the terms Asperger's syndrome and NVLD

interchangeably, some basic understanding of Rourke's (1989) theories can reduce confusion.

Parallel Model of Diagnosis



(Adapted from Rosenn, 2001 and Tanguay, 2001.)

> Nonverbal learning disorder (NVLD) is a diagnostic category developed outside of the *DSM-IV* nomenclature by Rourke (1989). It is characterized by deficits in perception, psychomotor coordination, visual-spatial organization, nonverbal problem-solving, and appreciation of conceptual incongruities and humor. (Tanguay, 2000, p. 1081).

NVLD is generally viewed as a form of right hemispheric dysfunction. Rourke describes this disability as dysfunction or damage to the white matter (long myelinated fiber) of the brain. Many different diagnoses are encompassed by this description; Asperger's syndrome, Multiple Sclerosis, Traumatic Brain Injury, and Fetal Alcohol syndrome being but a few (Rourke, 1999). Since many of the behaviours and difficulties displayed by individuals with these conditions are

similar, the observations, theories and interventions proposed by Rourke can be insightful.

From a teacher's perspective, distinguishing between Asperger's syndrome, high functioning autism and PDD-NOS is both inappropriate and non-productive. The similarities of these diagnoses and the common supports required by students with such disorders are more important than the differences. The bulk of this study therefore uses the term Asperger's syndrome and does not differentiate between the various associated terms.

Having clarified the relevant terminology, I continue with a review of the literature pertaining to Asperger's syndrome in Chapter 2.

CHAPTER 2

REVIEW OF THE LITERATURE: ASPERGER'S SYNDROME

Historical Background

Hans Asperger (1906-1980) was a Viennese pediatrician who worked with a number of boys who had considerable social deficits. Cumine, Leach and Stevenson (1998, p. 1) reported that:

> In addition to their poor social interaction skills, the boys had difficulties with the social use of language, together with a limited ability to use and understand gesture and facial expression. Also evident were repetitive, stereotypical behaviours, often with 'abnormal fixations' on certain objects.

In 1944, Asperger presented a paper, 'Autistic psychopathies in childhood'. The term 'autistic' was borrowed from work by Bleuler (1911) when he described "children who had withdrawn from participation in the social world" (Cumine, Leach & Stevenson, p. 1). Since the paper was written in German near the end of WWII, it was not widely shared. In the early 1980's Lorna Wing (1991) translated the paper into English and used the material in her own research.

While Asperger was working in Vienna, Leo Kanner was working in the United States with children who shared many of the characteristics of Asperger's clients, but had never engaged socially. He also used Bleuler's term of Autism. In 1943, he published his paper 'Autistic disturbance of affective contact'. Both Asperger's and Kanner's papers were studied by later investigators and used as a basis for understanding Autism and what has become known as Asperger's syndrome (Cumine, Leach & Stevenson, 1998), related to but different from Autism.

Until recently, Kanner's work with more severe Autism was better known, but the work of another investigator, Lorna Wing, became recognized in the 90's. Wing "was concerned that some children had the classic autistic features when very young, but developed fluent speech and a desire to socialize with others" (Attwood, 1998, p. 15). These characteristics, she believed, constituted a syndrome similar to, yet different from Autism. She worked with children who resembled Asperger's clients more closely than Kanner's. Her subsequent research could be considered the impetus for the ongoing study and the recognition and acceptance of Asperger's syndrome as a distinct condition.

Characteristics

A number of sources have suggested diagnostic criteria for Asperger's syndrome. Attwood (1998) has conveniently included criterial lists from the DSM IV (1994), the World Health Organization (ICD-10, 1993), and such authorities as Szatmari, Bremner and Nagy (1989), and Gillberg and Gillberg (1989) in the appendix of his book. Copies of these lists are included in Appendix B of this document. All four of these sets of criteria are quite similar. They all include the three areas of impairment identified earlier by Lorna Wing: "impairment of social interaction; impairment of social communication; impairment of social imagination, flexible thinking and imaginative play" (Cumine, Leach & Stevenson, 1998, p. 2). The following sketches of the characteristics assigned to social interaction, social communication, social imagination and flexibility of thought, motor skills, hypersensitivity, intelligence, depression and aggression are based on Attwood (1998) and Cumine, Leach and Stevenson (1998).

Social Interaction

Impairments associated with Asperger's include the following: isolation, often by choice; difficulty and frustration with social interaction; inability to make/keep friends; difficulty in perceiving social cues; inappropriate and potentially embarrassing social behaviours; and difficulty sensing or responding to the feelings of others.

Children with Asperger's syndrome are often loners who find social interactions bewilderingly complex. They have difficulty understanding situations from any point of view but their own and generally believe that everyone thinks the same way as they do. They find empathy to be extremely difficult and also have difficulty displaying affection. Social conventions are often not understood. As a result, children with Asperger's easily say and do things that embarrass or hurt the feelings of others. They are merely being honest in making observations or are responding to internal motivations. They are not generally malicious or deliberately unkind. When a teacher asks, "Who did this," they may respond, not realizing the social implications of being a 'tattle-tale'. They are often unaware of social problems and when they do become aware, lack the social logic needed to rectify situations.

Social Communication

The skills needed to communicate effectively are complex and frequently subtle. Mastery of tone of voice, innuendo and body language is critical for success. Children with Asperger's may experience the following impairments: the use of formal or pedantic language; a monotone or flat sounding voice;

limited facial expressions; limited eye to eye gaze; sometimes a loud voice; difficulty understanding and responding to facial expressions and body language; minimal use of gestures to communicate; difficulty understanding puns and metaphors (literal understanding primarily); difficulty understanding implied meanings; and difficulty both initiating and maintaining conversations.

Children with Asperger's are extremely awkward when engaging in social situations. They have difficulty starting conversations, and then, in following the intricacies and changes within conversations. Frequently they resort to discussing their all-consuming or perseverative area of interest. Not only are they more comfortable and knowledgeable regarding their favourite topic, but they also have difficulty appreciating that other people do not share their particular interests. Implied meanings, puns, metaphors and sarcasm are often beyond the understanding of these individuals. Neither imagery, nor gestures, nor tone of voice seem to convey much meaning to these children. Consequently, students with Asperger's also do not know how to use such communication techniques effectively. Attempts may result in social gaffs, such as sarcasm directed towards a teacher. Phrases such as 'pull up your socks' are frequently taken at face value unless such students have received direct instruction in the use of idiomatic language. Students with Asperger's have difficulty monitoring their own emotional responses to situations. Most might appear to be unmoved or disinterested when a situation calls for an emotional response. Some others might overreact by crying or laughing when a frown or a smile might be more appropriate.

Social Imagination and Flexibility of Thought

Impairments would include an all-absorbing preoccupation with an unusual interest; concrete or rote understanding of concepts (rather than abstract or deep); rigidity regarding structures, routines and rules; difficulty thinking or playing creatively; and inability to transfer "skills from one setting to another" (Cumine Leach & Stevenson, 1998, pp. 5-6). Children with Asperger's are often perceived as being stubborn or willful. Situations perceived as unknown or difficult cause so much stress that the child with Asperger's simply refuses to participate or cooperate. Changes in routines or structures are extremely stressful for these individuals, as are open-ended games and recess breaks that require play and less structured interactions. These students will repeatedly discuss their interest areas with anybody whether encouraged to do so or not. They have memorized obscure details and facts that they share with anybody who does not abruptly end the conversation. Perseverative topics might include weather phenomena such as hurricanes, electrical/computer topics, modes of transportation or specific animal topics. In a classroom, such children might refuse to read any book not dealing with their all-consuming area of interest. If they will read more widely, their choices generally will be non-fiction or books with predictable, formulaic writing such as science fiction and the Star Trek books. The social complexities found in most fiction are too taxing.

Creative writing is virtually impossible. Not only is the creative or imaginative thinking exceedingly difficult, but the actual fine motor task of printing or writing compounds the problem. Fairness and rules for what is right often

become themes for such children. Because of rigid thinking, as well as, difficulty understanding the subtleties of social interaction, children with Asperger's rely heavily on rules and rule-governed behaviours. Their thinking is often black or white and they have difficulty accepting shades of gray. Squabbles with peers may become common, ongoing and long-standing. Some peers will undoubtedly learn how easily students with Asperger's can be taunted and manipulated, thereby exacerbating the problem. In contrast, these students usually work hard at following the rules: They do not lie, they generally attend classes regularly (with the exception of physical education) and they generally do not smoke or abuse drugs or alcohol. Students with Asperger's have difficulty learning abstract or theoretical concepts and require greater use of manipulatives, visual supports, as well as, direct teaching and practice in order to do so. More time may also be required to master new ideas, especially since knowledge learned under one set of circumstances may not necessarily be generalized to another set of circumstances. Again, direct instruction and practice may be necessary. Tasks requiring synthesis, deduction, evaluation, abstract conceptualization or intuition may be extremely difficult or impossible for many students with Asperger's.

Motor Skills

Deficits were also included in all but the DSM-IV list of criteria. Motor clumsiness might include awkward or clumsy movements; stiff or peculiar gait; "organizational problems--unable to find his [her] way around, or collect together the equipment he [she] needs" (Cumine, Leach & Stevenson, 1998, p. 6). Weak

fine motor skills affecting penmanship and drawing, and difficulty completing tasks may also be evident.

Walking down a crowded hall during classroom changes without tripping or banging into someone can also be a challenge for students with Asperger's. Physical education classes are either dreaded or avoided. Deficits in hand-eye coordination, rhythm, balance, gross and fine motor skills are all common. When these pre-requisites are combined with the social interactions and cooperation required for team sports, most students with Asperger's find ways to avoid physical education. Some may simply refuse to participate, some may disappear or 'get lost', and others may develop somatic complaints. Similarly, weak fine motor skills make tasks such as writing, drawing, measuring, cutting, sewing and painting quite daunting. Many such children find that using a word processor is more comfortable and productive than using handwriting.

Organizing assignments, binders and lockers is often a highly challenging task. Deciding on categories, keeping work neat and in place, establishing timelines, staying focused on a topic of someone else's choice and completing assignments are difficult jobs for students with Asperger's. Other students with Asperger's may have become overly dependent upon structures and routines and are ritualistic in tidying and sorting their materials. Interruptions or reduced time to complete these preparations can cause acute distress.

Hypersensitivity

While not universal, hypersensitivity is experienced by a number of children with Asperger's. These children may over-react to sensory input such

as textures or sounds. They may complain about sounds that others ignore easily and may continue to wear soft, fleece sweat pants when most peers choose to wear more fashionable jeans. Some may listen to certain music on 'walkmans' or CD players whenever possible. Reactions to florescent lighting, smells and foods may also occur.

Other Factors

Features that may accompany Asperger's include repetitive movements or flapping when stressed, "a lack of sensitivity to low levels of pain. . . and. . . unusual facial grimaces or tics" (Attwood, 1998, p. 19). Gonzalez-Heydrich and Schonwald (2001) report that 60% of children with PDD display inattention difficulties and 40% display hyperactivity/impulsivity. This is particularly true of younger children. Poor social skills, clumsiness and a poor sense of visual space may contribute to the hyperactive behaviours (Rourke, 1999).

Intelligence Quotient Scores

Measurements by tests such as the Wechsler Intelligence Scale for Children (the WISC) usually fall within the average range for children with Asperger's. In fact, scores may range from mildly deficient to high average. However, there usually is a significant difference between the verbal and performance test scores, the verbal scores generally being stronger than those for non-verbal skills. If the discrepancy between the verbal and performance scores is significant, then students with Asperger's can be considered learning disabled, having a non-verbal learning disability.

Depression

Depression is a common added mental health condition experienced by many youth with Asperger's as they become adolescents (DSM-IV-text revision, 2000; Attwood, 1998). Rejection by peers, awareness of social inadequacies, increased academic and social expectations together with growing frustrations/anxieties in meeting those expectations, and decreased self esteem contribute to this potentially life-threatening, secondary mental health problem. Consequently, teachers need to be alert for signs of depression in those students identified with PDD-NOS.

Aggression

Angry outbursts and passive aggressive responses are often associated with Asperger's syndrome (Myles & Southwick, 1999; Attwood, 1998). Students with Asperger's frequently have difficulty understanding and monitoring their own emotional responses. They generally do not display many signs of anxiety prior to a "melt down" (Myles & Southwick, 1999). As a result, neither does the student seek solutions prior to losing control, nor does the teacher recognize signs of anxiety that could lead to intervention. When frustration tolerance becomes overwhelming, they may explode, displaying what might be labeled as a temper tantrum, or they may "shut down", becoming extremely passive and resistant. Either response is a problem in a classroom setting.

Other students seem to manage fine at school despite social and academic problems. Instead, they blow up after school.

> [Some] parents report that when their children arrive home, they often lose control. That is, the child experiences the rage attack,

> meltdown or neurological storm at home. It seems as if these students have used all of their self-control to manage at school, and once they get to a safe environment, they let go of some of the pressure that is bottled up within them (Myles & Southwick, 1999, p. 25).

In short, children with Asperger's or PDD-NOS may be difficult and challenging students. Many may not have been diagnosed but still display many of the above characteristics. Many may have been unofficially identified as the so-called nerds, victims and 'funny looking kids' in the school.

Medication

No medication had been found to treat the underlying conditions of Asperger's. However, a small number of children with Asperger's have been prescribed medications for some presenting behaviours and secondary diagnoses (Sloman, 1991). Stimulants, such as Methylphenidate (Ritalin), might be used for children who have marked attention difficulties. Selective serotonin re-uptake inhibitors (SSRI's), such as Fluvoxamine (Luvox) or Sertraline (Zoloft), and neuroleptics, such as Risperidone (Risperdal) or Quetiapine (Seroquel) have been used occasionally to treat obsessive-compulsive difficulties, repetitive thoughts, anxiety and aggression (Stein, 1996; Gonzalez-Heydrich & Schonwald, 2001). However, at this point, no single drug has been developed that significantly improves Asperger's syndrome.

Treatment

As knowledge of Asperger's continues to grow, so does information regarding treatment. The term "treatment" covers a wide range of services and

therapies. It may include educational placements and programming; specific skill training; vocational training; medication; emotional, social and behavioural supports; psychotherapy; counseling and support groups. Treatment appropriate for one student may be less effective for another. A variety of factors should influence treatment: analysis of specific strengths, limitations and needs of the student; availability of appropriate programming; and, attitudes and knowledge of service providers (including educators, doctors, social workers, group leaders and mental health providers).

Some forms of treatment have not shown clear evidence of success. For example, megavitamin treatments have been shown to be either minimally effective or totally ineffective (Tanguay, 2000). Food sensitivity might lead to some nutrient deficits that vitamins may improve; however, no long-term, significant change due to megavitamin doses has been identified. Also, insight-oriented psychotherapy has not been shown to be useful (Klin & Volkmar, 2000). Most students with Asperger's have difficulty understanding emotions (their own or others) and do not easily understand the relationships between experiences, emotions and reactions. Auditory integration training (AIT) has failed to show significant changes in autistic type symptoms. AIT "entails listening to 10 hours of music which has been filtered to dampen frequencies to which the person is hypersensitive" (Tanguay, 2000, p.1088). Similarly, facilitated communication has not been shown to be effective for individuals with severe communication difficulties.

> In facilitated communication, the facilitator guides the arm, wrist or fingers of the autistic person as he/she types messages on a

> keyboard. . . . Studies have shown that the messages come largely from the facilitator and not from the handicapped person (Tanguay, 2000, pp. 1088-1089).

Other forms of treatment have been shown to be helpful. Attwood strongly recommends cognitive behaviour therapy (CBT). He breaks this therapy into six steps: (1) assessment of the nature and degree of the disorder; (2) affective education; (3) cognitive restructuring (correcting distorted or dysfunctional beliefs); (4) stress management; (5) education for self reflection, self disclosure and self image; and, (6) practice. Similarly, Rosenn recommends psychotherapy of a cognitive-relational nature. The conceptual goals should include: (1) learn about relationships, (2) learn how to play, (3) decrease anxiety, (4) increase trust, (5) aid in self esteem, (6) explain impairments, and (7) explain impact of behaviour on therapist. He emphasizes that the therapist must "explain [the] child to family, schools, and other helping professionals" (Rosenn, 2001, p. 13). Goldstein (2001) and Rosenn (2001) also promote family therapy for several reasons. It can help the family members to understand the disorder, it can provide emotional support, and it can provide training to help parents with home-based interventions.

Current literature commonly advocates social and communication skills training; however, research confirming the efficacy of such training for students with Asperger's is scarce. The two programs reviewed by Safran (2001) indicated mixed results. Although the targeted skills were improved, generalization to other settings was limited. Nevertheless, common sense dictates that this would be the most sensible and productive approach.

Finding trained professionals to offer the training may be difficult (Klin & Volkmar, 2000). However, schools, treatment centers or hospitals may be starting points in the search for such programming. In Winnipeg, for example, several school divisions have combined resources to provide classes for students with Autism. The curriculum has been specifically designed to meet the needs of these individuals. Unfortunately, enrollment capacity is limited and higher functioning Autistic students and students with Asperger's might require more academic challenges. In other school districts and in other areas, other supportive programs might also be available. Careful investigation and lobbying may be required to gain access to the most appropriate programming.

Klin and Volkmar (2000) suggest that a number of "packages" may support social skills and communication programming: (1) social stories (Gray, 1993), (2) visual strategies for improving communication (Hodgdon (1995, 1996), (3) social perception skills training (Minskoff 1987, 1994; Minskoff & DeMoss, 1994), and, (4) teaching theory of mind (Baron-Cohen & Howlin, 1998). Other programs are gradually being published. For example, LinguiSystems has recently published a variety of social skills materials. Wood, Davis, Swindle and Quirk have published Developmental Therapy—Developmental Teaching, 3rd edition (1996). Some of these were developed specifically with Autism and Asperger's in mind and others were developed as general packages promoting social skills development. Unfortunately, studies researching the efficacy of these packages are limited.

Three key features should be featured in social skills and communication training programs: (1) awareness of conventional pragmatic or conversation rules, (2) appropriate 'reading' of social cues, and (3) self-monitoring in conversation (Klin & Volkmar, 2000).

Other aspects that should be present in an overall program for a student with Asperger's include organization training and supports, access to occupational therapy, computer training/supports, behavioural management procedures, counseling, escape/time out resources, problem-solving supports and training, advocacy/mentorship resources, low enrollment and a curriculum designed to support the "individual's socialization skills, vocational potential and quality of life" (Klin & Volkmar, 2000, p. 359).

Causes, Frequency, Onset and Diagnosis

The cause(s) of Asperger's is still considered speculative. Factors that might initiate or contribute to PDD disorders include biological or genetic factors, pregnancy/birth conditions such as various traumas or exposure to certain viruses/infections, neurochemical variations, exposure to radiation and neurological conditions (Cumine, Leach & Stevenson, 1998; Peschel, 1995; Rourke, 1999). Manning and Baron-Cohen have found that children with Autism and Asperger's have "ring fingers that are abnormally long compared with their index fingers" (The Economist, 2001, p. 93). Apparently the sizes of fingers are determined by testosterone exposure *in utero*. Close relatives display similar relative finger sizes.

Other research findings have varied; although, many have supported a

genetic predisposition to the condition. For example, Comings and Comings (1990) have reported "a high frequency of alcoholism, drug abuse, obsessive-compulsive, and other behaviour disorders in the relatives of these patients" (Comings & Comings, 1990, p. 180). However, another study by Szatmari and associates (Szatmari, Jones, Fisman, Tuff, Bartolucci, Mahoney & Bryson, 1995) has cast some doubt on the validity of using family histories to assess for the risk of PDD. Yet in 1996, Szatmari and associates (Szatmari, Jones, Holden, Bryson, Mahoney, Tuff, MacLean, White, Bartolucci, Schutz, Robinson & Hoult, 1996) have stated "that the considerable variation in clinical features in PDD is under familial, and presumably genetic, control" (p. 359). Whatever the cause(s) or contributing factors are, neuroimaging (Volkmar, Klin, Schultz, Bronen, Marans, Sparrow & Cohen, 1996) and autopsies (Pershel, 1995) have shown distinct physical differences in the brains of individuals with PDD.

Statistics on prevalence and male to female ratios vary considerably. Kiln and Volkmar (1997) report variations in Asperger's syndrome frequency from 1.0 per 1000 children to 7.1 per 1000 children.

Male to female ratios have ranged from 9:1 to 2.3:1 (Klin & Volkmar, 1997; Howlin, 1996; Szatmari, Jones, Holden, Bryson, Mahoney, Tuff, MacLean, White, Bartolucci, Schutz, Robinson & Hoult, 1996). Rourke (1989, 1999) believes that NVLD is likely equally prevalent in both sexes, but different cultural expectations for females may have lead to this disparity. While NVLD encompasses more conditions than just Asperger's, the same cultural conditioning may be influencing referrals for diagnosis of Apergers. Although,

Attwood (2000) believes that more males than females have Asperger's syndrome (4:1), he also believes that females are referred for diagnosis less often (10:1) because girls often have better coping mechanisms than boys. These coping mechanisms include imitation skills, peer supports, less disruptive behaviours and different rates of learning.

If children with PDD-NOS were to be added to the frequency statistics, then children with such features would be even more common. In addition, Pomeroy (1997) reports an increase in the rate of referrals for PDD disorders, possibly due to any or all of "a true increase in incidence, a broader diagnostic inclusiveness, or improved identification." Such increases in medical referrals would also indicate that at any given time most schools could expect to have at least one and possibly several such children within each of their student bodies. In fact, changes in curriculum may be exacerbating increased rates of referral. Previously, much schoolwork was based on rote learning and individual work. Students with Asperger's would excel under those conditions. Newer curriculums emphasize abstract thinking skills, creative problem solving and group work. The same students would struggle with these expectations.

In 1991, Wing "suggested that. . . delays and deviances are present in the first two years of life" (Klin & Volkmar, 1997, p. 96). Nevertheless, in North America the mean age for diagnosis is ten years and usually these children have had seven or eight previous diagnoses (Cohen, 1997). Confusion can occur because frequently the behaviours associated with Asperger's overlap, and even co-exist, with other conditions such as emotional disorders, language disorders,

learning disabilities, Tourettes syndrome, attention deficit hyperactivity disorder, Rett's disorder, Fragile X, obsessive-compulsive disorder or schizoid personality disorder (Cumine, Leach & Stevenson, 1998).

Delayed and mis- diagnoses cause frustrations for both the children and the adults who live and work with these children. Appropriate programming and supports will not likely be provided without an accurate and timely identification. Some of the difficulties associated with misdiagnosis have been discussed more specifically by Klin and Volkmar:

> Many individuals with Asperger's were diagnosed as learning disabled with eccentric features, a non-psychiatric diagnostic label that is much less effective in securing services. Others, who were given the diagnosis of autism. . . had often to contend with educational programs designed for much lower functioning children, thus failing to have their relative strengths and unique disabilities properly addressed. Yet another group of individuals with AS [Asperger's syndrome] are sometimes characterized as exhibiting 'Social-Emotional Maladjustment' (SEM), an educational label that is often associated with conduct problems and willful maladaptive behaviours. (Klin & Volkmar, 1996, p.3)

Obviously, all of these difficulties have strong implications for teachers and school programming. Because diagnosis is based on observable behaviours, teachers may be able to provide parents and medical personnel with useful information by using the guidelines and checklists provided in books such as Attwood (1998) or Cumine, Leach and Stevenson (1998). In fact, Szatmari (1991, p. 89) states, "early identification and intervention appear to be extremely important". He provides an example of a day care providing beneficial supports with medical consultation. In addition, teachers may need to assist parents in seeking medical diagnosis and social supports. These parents may be highly

stressed, unsure of their own parenting abilities, and experience marital discord (Fisman & Wolf, 1991). They will benefit from collaborative, empathetic relationships with school staff and with other parents. As well, training, sensitivity and understanding of these disorders are critical for the professionals who work with them. Finally, educators will need to plan adaptations, individualized educational plans, and possibly, entire programs to accommodate the needs of these individuals (Attwood, 1998, Cumine, Leach & Stevenson, 1998).

Current Theories

Understanding how children with Asperger's think and behave assists adults in modifying environmental factors and in designing educational plans. In attempts to further this understanding, several theories have been proposed and described by experts such as Miller (1991); Cumine, Leach and Stevenson (1998), Baron-Cohen (1991) and Klin (1997). Theory of Mind, Central Coherence Deficit and Executive Function Deficit are three such theories.

Theory of Mind

A *Theory of Mind* test, the first theory described, was developed by Baron-Cohen (1991) and his colleagues in 1985. Cumine, Leach and Stevenson (1998, p. 19) describe *Theory of Mind* as "the ability to appreciate that other people have mental states: intentions, needs, desires and beliefs, which may be different to our own". This test is now well known as the Sally/Anne test:

> In the Sally/Anne test, Sally and Anne are two dolls. Sally has a basket and Anne has a box. In the story, which is acted out in front of the child, Sally puts a marble into her basket while Anne is watching. She then leaves to go for a walk. While she is away, Anne puts Sally's marble into her own box. Sally returns from her

> walk and wants to play with her marble. [Subjects observing this drama are asked, "Where will Sally look for her marble?"] The correct answer is, 'In her basket', for that is where Sally left her marble, and where she believes it still is. Children with autism answer that Sally will look, 'In the box', because that is where the marble actually is - even though Sally has not seen Anne taking it from the basket and placing it in the box. This contrasts with the children in the control groups who gave the correct answer (Cumine, Leach & Stevenson, p. 19).

Control groups included children with Down's syndrome above the mental age of four years and normal four-year-old children. Both control groups performed well. However, a chronological age of eleven was the lowest age for a child with Asperger's syndrome to pass this test. Baron-Cohen (1991, p. 48) concluded that "subjects with autism show severe impairments in the ability to attribute beliefs to themselves and others." He explained this by stating that

> certain mental states are easier to recall than others, for all subjects. For example, *see* and *want* are easier than *believe.* But whereas for normal children *imagine* and *pretend* are as easy as *see* and *want*, for people with autism they are significantly more difficult (1991, p. 48).

Implications

Baron-Cohen hypothesized that both deviance and delay occur in children with autism in regard to the development of a "theory of mind". Cumine, Leach and Stevenson (1998) clearly list and explain how these impairments cause difficulties in children with Asperger's. An abbreviated list includes: (a) difficulty in predicting others' behaviour, leading to a fear and avoidance of other people; (b) difficulty in reading the intentions of others and understanding the motives behind their behaviour; (c) difficulty in explaining own behaviour; (d) difficulty in understanding emotions - their own and those of others, leading to a lack of

empathy; (e) difficulty understanding that behaviour affects how others think or feel, leading to a lack of conscience, of motivation to please; (f) difficulty taking into account what other people know or can be expected to know, leading to pedantic or incomprehensible language; (g) inability to read and react to the listener's level of interest in what is being said; (h) inability to anticipate what others might think of one's actions; (i) inability to deceive or to understand deception; (j) no sharing of attention, leading to idiosyncratic reference; (k) lack of understanding of social interaction, leading to difficulties with turn-taking, poor topic maintenance in conversation, and inappropriate use of eye contact; and (l) difficulty in understanding 'pretend', and differentiating fact from fiction (pp. 21-22). The Central Coherence Deficit Theory is another way of examining Asperger's syndrome.

The Central Coherence Deficit Theory

In 1989, Frith proposed the *Central Coherence Deficit Theory* to account for difficulties that the *Theory of Mind* did not include, such as demands for routines, focusing on parts/details rather than the whole, all-absorbing interests and evidence of special skills. She based her theory on observations from WISC results. Children with autism performed unusually well on the Block Design and Embedded Figures tests. These tests required children to assemble blocks to match a drawing of a whole or complete picture, and to find a hidden figure. She believed that these children did well because they were unable to see the whole picture and thus were able to focus on the necessary parts.

> Frith (1989) describes 'central coherence' as the tendency to draw together diverse information to construct higher-level meaning in

> context. In individuals who process information normally, there is a tendency to make sense of situations and events according to their context. In individuals with Asperger syndrome this does not exist (Cumine, Leach & Stevenson, p. 25).

Implications

Characteristics associated with *Central Coherence Deficit Theory* include (a) idiosyncratic focus of attention, (b) imposition of own perspective, (c) preference for the known, (d) inattentiveness to new tasks (e) difficulty in choosing and prioritizing, (f) difficulty in organizing self, materials, experiences, (g) difficulty seeing connections and generalizing skills and knowledge, and (h) lack of compliance (Cumine, Leach & Stevenson, p. 26).

Executive Function Deficit

The third theory that is proposed to explain Asperger's syndrome is *Executive Function Deficit.* This theory explains the ability of children to use problem-solving strategies to meet desired goals. Impaired functioning of the brain's frontal lobes is thought to cause rigidity and perseveration, since the frontal lobes deal with "planning; self-monitoring; inhibition; flexibility; organized search; set maintenance and change" (Cumine, Leach & Stevenson, p. 27).

Implications

Difficulties of Executive Function Deficit include: (a) difficulties in perceiving emotion, (b) difficulties in imitation, (c) difficulties in pretend play, (d) difficulty in planning, and (e) difficulty in starting and stopping (Cumine, Leach & Stevenson, p. 28).

These three theories account for the majority of social interaction, social communication and social imagination/flexible thinking difficulties that are

commonly associated with children who have Asperger's or PDD-NOS. They clearly expose the range and severity of difficulties experienced by most such individuals.

Educational Assessments

The characteristics associated with Asperger's syndrome impact significantly, not just on social interactions, but also on academic achievement. A thorough educational assessment should be used as a basis for program planning and for development of adaptations, thus ensuring that classroom experiences are as successful as possible. Rourke (1989); Klin, Sparrow, Marans, Carter, and Volkmar (2000); and, Myles and Simpson (1998) have thoroughly discussed assessment in their respective books. They discuss the usefulness of various formal and informal assessment tools. Some of these, such as the WISC and the *Vineland Adaptive Behavior Scale* (1984), are used by doctors and clinicians. Others, such as commercial achievement tests, curriculum based assessments and informal reading inventories, are more likely used by educators. All professionals who work with children with Asperger's should be aware of the usefulness and implications of the various means of assessment. In fact, a multi-disciplinary assessment would likely yield the most comprehensive results.

Knowledge of the characteristics of Asperger's syndrome and NVLD can help to ascertain the potential academic strengths and limitations of a student with Asperger's syndrome. For example, Rourke (1999) states that the deficits and assets of NVLD

> manifest academically by difficulties in subjects like mechanical arithmetic, mathematics (particularly geometry), and science (charting/graphing), while word decoding, spelling and rote memory are strengths (Rourke, 1999).

In reading, students with Asperger's initially may be slow to acquire the necessary skills. Around grade 3 these skills begin to develop rapidly (Rourke, 1999). Word recognition becomes strong, while comprehension remains relatively weak. Students with Asperger's may be able to recall much of the contents of an article, but be unable to make predictions, evaluate strengths and limitations, make inferences or apply the information to other circumstances. They experience difficulty in selecting the main ideas and in delegating supporting details to those main ideas. Nevertheless, reading is usually an area of strength in relation to mathematics.

In arithmetic, students with Asperger's may know the component steps, but have trouble knowing when to use those steps. Mathematical problem solving is limited by these mechanical difficulties as well as by relatively weak reading comprehension. Aligning numbers may be difficult due to poor fine motor control. Geometry, charting and graphing are also particularly difficult.

Initially, language appears to be an area of strength, as most students with Asperger's are good talkers. However, language has three parts: (a) form—semantics and syntax, (b) content—ideas, and (c) function—pragmatics and consideration of audience. Students with Asperger's usually are strong in the use of form (words and grammar), limited in their range and expression of ideas, and very weak in their functional use of language (social interaction and communication). This affects discussions in the classroom as well as written

assignments.

Although spelling is usually strong, most written tasks are quite taxing. Deficits in fine motor skills (penmanship), creativity, language usage, social knowledge and organization may combine to make writing a daunting activity.

Certain learning styles and preferences are often associated with Asperger's. Classroom observations, inventories and responses during testing can be used to determine which of the following are characteristic of the particular child being assessed. For example, sequential rather than simultaneous learning is preferred. Linear rather than global or random thinking is easier. In other words, students with Asperger's usually prefer a part-to-whole approach rather than the whole-to-part approach. Generalization skills, flexibility and spontaneity are weak. Conversely, consistency, structure and routine help the child to flourish. Rote learning is an area of strength. Metacognitive skills such as self-talk and self-monitoring do not develop spontaneously. They require direct, explicit teaching and practice in order to be effective. "Many students with Asperger syndrome are unable to organize or prioritize multilevel instructions and require brief, small instructional steps for successful task completion" (Myles & Simpson, 1998, p. 29). Because of a history of poor peer interactions, students with Asperger's may prefer to work with an adult or alone, rather than with other students. They enjoy talking and listening but may require assistance to make meaning from a discussion or presentation. Visual supports and demonstrations are helpful.

While these items do not constitute a comprehensive list of academic

strengths and deficits, or learning preferences for every child with Asperger's, they do offer a rich basis for initiating an academic assessment. When this information is combined with an analysis of behavioural strengths and limitations, then a meaningful program plan can be initiated.

Educational Planning and Interventions

Children with Asperger's are individuals before they are case studies with a medical condition. Personalities, intelligence(s), motivation, strengths and limitations should all be considered before determining either long-range goals or short-term objectives (Towbin, 1997). Some adults with Asperger's have been able to earn university degrees and others have required long-term, sheltered placements (Myles & Simpson, 1998; Attwood, 2000). Educational, social, medical and parental resources are also critical pieces of information. Determine what access the child might have to therapists, tutors, computers, teaching assistants, video recorders, tape recorders and taped books. Other factors to consider include flexibility of school organization, attitudes and knowledge of school personnel, the nature of the potential peer group, the degree of difficulty associated with curricular subjects, provincial and district policies, transportation logistics and the physical layout of the school and its classrooms. Only after considering all of these factors, can program planning begin.

Educational interventions seem to fall into two broad categories: first, adaptations to the environment in order to minimize the difficulties normally experienced by the child; and second, practices to help the child learn to gain some control over the difficulties which would normally cause friction within a

school setting. The first is easier than the second, and is often a pre-requisite for the second set of interventions to occur.

Options might be limited by controversy that exists regarding the placement of students in specialized programs. Szatmari believes that

> it is extremely important to keep the Asperger's syndrome child integrated with other non-handicapped children. Combining autistic and Asperger's syndrome children into a single treatment program without integration can lead to inappropriate behaviour and very slow progress, although evidence for this is needed. However, integration without careful planning and extra resources may be harmful to the child and very discouraging to parents (1991, p. 89).

At the same time, Klin and Volkmar (1996, p. 5) recommend a "relatively small setting with ample opportunity for individual attention, individualized approach and small work groups". Apparently, the most enabling school environment(s) has only been recommended through generalities and has not been validated through research.

The two sources frequently referenced throughout this literature review (Attwood, 1998; Cumine, Leach & Stevenson, 1998) are filled with numerous suggestions for interventions, objectives and strategies. Articles focusing on interventions applicable to school settings have been published by Klin and Volkmar (1995 & 1996) and Williams (1995). Interventions have been organized into many of the following categories: Vulnerability/safety, social interactions, language/communication skills, organizational skills, academic and learning supports, motor skills interventions, vocational training, and interests/routines. In each case, recommendations are made for the environment, as well as, for the staff and peers to develop modifications that will meet the needy child's comfort

level. Then various forms of explicit teaching, practice, reinforcement and use of technologies are used to teach these students to meet not only curricular objectives but also objectives determined by the child's functional behaviour. Sample interventions include time outs, computer use, role playing, using rules to teach social interaction skills, direct teaching of social cues and skills, providing limited time to indulge in interest area, giving advance warning for routine changes, using manipulatives and visual supports, allowing extra time for tests and assignments, decreasing participation in team sports while increasing the training of gross motor skills, and teaching lifestyle choices and visualization skills. These are all strategies that many teachers already use with other students. However, the cited sources present the classroom strategies in a thoughtful and organized manner that make them easier to research and implement when teacher time is minimal and demands are high.

Because the literature indicates that Asperger's syndrome is relatively uncommon, studying a group or a number of individuals is difficult and does not reflect the natural setting of most students with this condition. In other words, most such students live and go to school in their own communities and are integrated into regular classrooms. Yet because of the syndrome, such students exhibit specific behaviours and require specific adaptations. At the same time, each student is an individual with his or her own unique personality and characteristics. So studying the details of one particular individual and attempting to understand that individual as fully as possible is a logical and realistic form of research.

Having provided a review of the literature on Asperger's syndrome in this chapter, Chapter 3 examines school learning, in particular, the development of literacy in adolescence.

CHAPTER 3

REVIEW OF THE LITERATURE: ADOLESCENT LITERACY

Selecting a theme to support the development of literacy skills of my small group required that I begin by researching the literature regarding the literacy development of older or adolescent readers. Then I needed to consider the application of that theory and research with respect to the learning preferences of students with Asperger's. Next, I considered a specific instructional strategy that would provide a starting point for instruction, an instructional strategy shown to be effective through research, but tempered to meet the needs of students with Asperger's syndrome.

Literacy Considerations

The literature that I reviewed reinforced the importance of a number of factors necessary for literacy development. While the following factors do not constitute a comprehensive list, they do reflect significant areas that should be addressed in developing an instructional program.

Combining Reading and Writing

Ideally, reading and writing instruction is interwoven. Each should be used to develop the other. Both serve to expand thinking and understanding. "When reading and writing are taught in tandem, the union influences content learning in ways not possible when students read without writing or write without reading" (Vacca & Vacca, p. 256). Teaching reading and writing in concert "fosters communication, enhances problem solving, and makes learning more

powerful than if reading or writing is engaged in separately" (Vacca & Vacca, 1999, p. 261). Readers with strong skills in either reading or writing usually display strong skills in the other area as well. Extensive reading tends to improve writing skills (Vacca & Vacca, 1999).

Although all four of my students were more skilled in reading than writing, only one could have been described as a reader. All of the students were quite weak with respect to writing. This was particularly true of Jeff—his reading skills were average, his writing skills were abysmal and much of his free time was spent playing with a Game Boy. Since reading was a relative strength for each of the students, reading was an avenue that could be used to bolster writing skills. A remaining concern was overcoming individual and collective resistance to writing.

Efferent Writing Predominates

Most reading materials can be divided into two categories—efferent and aesthetic. Aesthetic materials deal with emotions, the senses and feelings. Most poems and novels would fall into this category. Efferent reading deals with "what is to be extracted and retained after the reading event" (Rosenblatt, 1994, p. 1066). Efferent reading is largely informational in nature. Most content area reading is efferent. For adolescents

> a good deal of school reading seems to be informational. Too often. . . [information is given] to complete an assignment that does not give the student a clear idea about how to use the information once it is obtained (Goodman, 1994, p. 1117).

I reasoned that if the majority of the reading required of teenagers falls into the efferent category, then focusing on the reading of informative text would

be an effective instructional emphasis. Also, teaching students how to comprehend and use content area information would help students to be more effective and comfortable in future school placements, and ultimately in their careers.

Motivation

Motivation is key to purposeful learning (Vacca & Vacca, 1999; Mathewson, 1994). While student enthusiasm for participating in a learning activity is desirable, student understanding of the purpose for that activity is critical. Students should know that the "instructed techniques are useful and necessary, [and they should know the] conditions under which strategies are applied and not applied" (Paris, Lipson, & Wixson, 1994, p. 805).

Most students with Asperger's syndrome are quite motivated when their work relates to their area of compelling interest; however, they must also learn to participate in unrelated activities and learn about prescribed curriculum topics. Thus, my instructional intervention considered motivation. By making the purpose of the task explicit at the outset and frequently restating the purpose of activities, I planned to enhance participation. Another component of the instructional intervention focused on the way the text is organized.

Text Schema

Understanding the author's schema or organizational framework is vital both in terms of "getting the author's message" (Anderson, 1994, p. 463), and also in terms of developing one's own knowledge. Good readers are able to decipher the author's plan. According to Anderson, understanding the author's

organization improves both comprehension and recall. Direct instruction in identifying text frameworks will develop these abilities. Pearson and Camperell (1994) would agree:

> The most efficient strategy students can adopt in typical school-learning or lab-learning situations is to identify and use the author's organizational framework to guide and structure their attempts to understand and remember information from textual materials. Students who are familiar with the way texts are typically organized can use that knowledge to comprehend and remember by relating the organizational structure, or schema, of the text to their prior knowledge (stored schemata) about how texts are organized and what to expect from texts organized in certain ways (pp. 460-461).

Part of the organizational framework relates to how the author has connected the main topics with the subtopics.

Information Linkages

Understanding the linkages or relationships between pieces of information enhances learning. This understanding helps students to grasp the relevance of the new material. Without this knowledge, facts seem arbitrary; with this knowledge, facts become significant. Two consequences of developing knowledge structures are likely to occur: (a) awareness of these structures enables students to deal with novel situations and (b) understanding the significance of factual information facilitates memory and recall (Bransford, 1994).

Understanding hierarchies of information, patterns and relationships is very difficult for students with Asperger's syndrome. Consequently, dealing with novel situations and understanding the significance of new data have been reported as areas of difficulty. Direct instruction is often required to teach

relevant organizational schemata.

Background Knowledge

Student background knowledge is important. That knowledge includes, vocabulary, language constructs (semantics, syntax and grammar), content area knowledge as well as schemata or the knowledge of text structures. Activating this background knowledge facilitates the learning of new knowledge. Some students

> may appear to have poor comprehension and memory skills *not* because they have some inherent comprehension or memory "deficits," but because they lack, or fail to activate, the background knowledge that was presupposed by a message or text (Bransford, 1994, p. 484).

Branford's statement seems to apply to students with Asperger's syndrome. These students often have learned large amounts of information, but do not have efficient mechanisms for understanding how details interrelate. They need assistance in preparing to learn to new concepts by reviewing related concepts and not only connecting these ideas to what they already know, but also linking the new concepts to one another in a hierarchical framework.

Metacognition

Metacognition is related to schemata and understanding of self. Vacca and Vacca define metacognition as "our ability to think and control our own learning" (1994, p. 46). This involves self-knowledge, task knowledge and self-regulation. Students need to be able to comprehend and monitor their own learning. They need to learn not just a variety of useful strategies to enhance learning, but must also learn when and how to use those strategies. Garner's

(1994) research suggests that metacognition is related to executive control. Both are associated with task analysis, planning and monitoring progress at a cognitive level. Garner also believes that executive routines can be taught. Students can be taught not just the "use of a strategy, [but also] how to employ, monitor, check and evaluate the strategy" (Garner, 1994, p. 722).

As executive functions have been considered a key area of deficit for many students with Asperger's, this is good news. Through direct, explicit instruction and practice, educators should be able to teach students strategies to enhance their learning from text as well as how to implement these strategies effectively and monitor success.

Bearing in mind the tenants of good instruction described above, I eventually decided to teach this group note-taking. This ultimate skill incorporated a variety of sub-skills and characteristics that would match many of the students' needs with their current functioning levels and would provide the students with skills they could use in a variety of settings, for a variety of purposes. Both reading and writing would be involved and teaching "strategies" to help the students cope with learning from text would be a primary focus. The texts I chose to use would relate to the curriculum, and therefore, I would be providing an authentic academic experience that because of its relevance would be motivating. How to take notes became the instructional focus.

Advantages of Note-Taking

Notes can be used to summarize a variety of informational texts such as

compare/contrast, description, cause/effect, problem/solution and series of events (Gunning, 1998). Learning one form of note-taking and then learning to generalize that technique to a wide variety of text structures would make this technique worthy of knowing. Most content area textbooks use predictable formats including titles, headings, subheadings, introductory paragraph(s) and conclusions/summaries. These components of typical chapters within a text would readily lend themselves to a note-taking outline. A clearly structured, yet linear hierarchy would make this approach reasonably compatible with the preferred learning styles of students with Asperger's. In addition, this technique would be useful to the other students in the group.

Reading and writing would be intertwined through this process. Students would read text information and would write the key features in a note-taking format such as the "Two Column Notes" organizer in *Success for All Learners: A Handbook on Differentiating Instruction* (1996, p. 6.83. See Appendix F.) or the Notemaking Guide described by Gawith (1992, p. 56). At the same time, the amount of writing would be limited. The students who ordinarily refused to write might be willing to write phrases constituted in headings, sub headings and describing important details. The organization and requirements of the writing would be highly structured, providing boundaries for a task that is frequently overwhelming for disabled learners. Hopefully, note-taking would reduce student resistance to writing. My students would be able to anticipate success given the structure and limitations of the task.

Motivation would be enhanced by helping students understand the broad,

long-term usefulness of note-taking. Learning that such a strategy can be used throughout the school years and across subject areas should help students appreciate the worthiness of the task.

Using a variety of textbooks from different subject areas and grade levels should not only help these boys to practice this new technique, but should help them to generalize what they were learning.

Both cognition and metacognition would be required to create notes successfully. Students would need to learn how to recognize the overall theme of the material and how to select the main topics and supporting details. In other words, they would learn how to decipher the author's organizational format and then interpret that format through note-taking and developing an outline. Students would learn both the procedures and the implementation of the technique using various texts. They would also learn the gist or essential ideas of the material they were outlining, thus developing comprehension skills. For my purposes, learning content information would be a coincidental advantage.

Directly teaching the interrelationships between titles, main ideas, sub headings and supporting details should help students further their understanding of linkages and their understanding of hierarchies of information. All information is not of equal importance. Some is critical, some is informative or supportive, and some is of relatively little importance. Students need to be able to determine what the main ideas of the text are and to choose relevant details and examples that clarify those main ideas. Understanding this concept should help students to expand their knowledge of interrelationships of data within texts. With

assistance, knowledge of interrelationships could be applied to other topics, settings and people. Also, by understanding the linkages of the data, retrieval of information (both memory and study skills) should improve.

Lastly, greater independence should go hand-in-hand with the acquisition of note-taking strategies. As an outcome of this instruction, students would more likely be able to find information/ideas without teacher support and organize these ideas into a hierarchy as a study strategy to facilitate comprehension and recall. They would ultimately have a framework for studying that they could initiate without assistance. If they have missed a class, they could review the material more readily with less teacher input. Note-taking strategies give students a means of delving into a text and extracting key information, even when the material might be written at a level that is difficult for the students to read. This is important since less able students are frequently required to use classroom textbooks written at levels that they cannot ordinarily read independently.

Selecting a Note-Taking Format

I considered a wide range of note-taking formats before making a final decision. These included two-column notes, the Cornell method, the REAP strategy, an outline format, margin notetaking, colour-coded highlighting, slim jims, webbing, summarizing, topic and concept cards, cloze formats and Inspiration (1997), a computer program. Descriptors of most of these and other formats can be found in Lipson, and Wixon, (1991); Muskingum College (1998); Gunning, (1998) and Manitoba Education and Training (1996, 1997,1998).

I wanted to teach my students a format that would be fairly easy and straightforward, that could be used for a variety of text structures, that could be organized within a binder, that could later be adapted for use with lectures and video presentations, that would be familiar to many classroom teachers, that could be used by students with minimal supports and that could be adapted to incorporate other note-taking techniques if needed.

I initially rejected some note-taking techniques because they did not meet most of my criteria. For example, margin note-taking and coloured highlighting required either photocopies or disposable texts because the materials would be marked or defaced. Such supports would not necessarily be available in future classrooms. Slim jims, and topic and concept cards could not easily be transported or stored in a binder format. Teaching students to use a binder to organize materials enables students with learning disabilities to appear similar to other students. Also, accidentally dropping index cards or slips of papers would cause further disorganization. Cloze formats would require considerable classroom teacher support and minimize student independence. Summarizing techniques (Friend, 2001; Swanson, & De La Paz, 1998) require students to ignore or delete trivial information. I did not think that students who had difficulty distinguishing essential from trivial data would be able to begin summarizing by deleting trivial data. Summarizing also required grouping paragraphs and generalizing information, other concepts that I believed would be difficult for my students. Traditional outlines would require considerable pre-teaching to ensure mastery of the sequence of upper and lower case Roman numerals, alphabet

letters, and Arabic numbers. Webbing or mapping, as exemplified in the Inspiration software, is succinct and efficient at displaying linkages, but might be too random to be preferred by students with Asperger's. These students usually excel using sequential, linear methods. Webbing also cannot always fit on a letter-sized piece of paper, especially if a student has large handwriting or is condensing a lengthy text.

Through this process of elimination, I first selected the two-column method of note-taking. A sample two-column format can be found in the Appendix. Gawith's (1992) notemaking guide, REAP and the Cornell method (Muskingum, 1998) offer variations of the two-column method. Variations include adding more columns for additional information (e.g. page numbers, memory triggers, personal reactions, questions and other information sources), incorporating indentation or enumeration to delineate main topics and lesser points (incorporating aspects of traditional outlines) and prescribing specifically-sized columns and formatting. By incorporating aspects of these variations, I would be able to expand or refine the two-column method once my students had mastered its basic use.

Having decided on a note-taking format and having outlined the rationale underlying the instructional intervention, I now turn to describing my research procedures in more depth.

CHAPTER 4

DESIGN AND PROCEDURES

Reviewing the literature currently available regarding Asperger's syndrome and adolescent literacy development set the stage for this study. However, understanding the Asperger's syndrome in general, and understanding the impact of that condition on one individual specifically, could be quite different. A case study approach was therefore used to answer the question 'How does an adolescent with Asperger's syndrome learn most effectively in the classroom?' This approach was selected because "a small aspect of the case may be found by many readers to modify an existing understanding about cases in general, even when the case is not typical" (Stake, 1998, p. 96). So, as a result, people who live and work with children with Asperger's syndrome might learn about the syndrome at an emotional and experiential level, not just at a theoretical level, while others would benefit from learning about a successful instructional intervention.

Narrative Inquiry

A narrative approach was used to develop the case study. Narrative inquiry encompasses both "phenomenon and method" (Connelly & Clandinin, 1991, p. 121). It requires the researcher to collect and characterize the phenomena of human experience, also known as the "story", and to write a narrative of the experience. Such writing provides both context and interpretation to enhance understanding. "The educational importance of this line of work is

that it brings theoretical ideas about the nature of human life as lived to bear on educational experience as lived" (Connelly & Clandinin, 1991, p. 125).

The entire process is collaborative: The events are the participant's, but the selection and narration of those events are the researcher's. In other words, the adolescent's experiences and products, carefully selected and honed, together with the researcher's writing should produce a meaningful report. Classroom feedback from the participant ensures accuracy. Both parties, their skills and knowledge, are required for an effective narration.

Collecting and Analyzing Data

Data collection and analysis were interwoven throughout this study. Janesick stated that "design decisions are made throughout the study" (1998, pp. 38-39). In fact, the relation between my instruction and Jeff's learning could have been viewed as a dance. Although, as a teacher I might have led, Jeff's responses influenced the direction, size and style of my steps. Those decisions were ongoing. The exact nature of the intervention evolved as we influenced each other.

Initial raw data consisted of lesson plans, samples of student work, as well as, post-lesson reflections and observations written by the researcher. All of these forms focused "on words as the basic form in which the data are found" (Miles & Huberman, 1994, p. 51).

First, the raw data in the form of a tutoring plan was 'written up' by the researcher and stored on the computer. The tutoring plan combined lesson objectives, classroom activities, teacher comments/reflections, and later,

responses from a university advisor. The very acts of transcribing, typing and editing helped to clarify the material in the researcher's mind. In addition, typed material was more easily "read, edited for accuracy, commented on, coded, and analyzed. . . "(Miles and Huberman, 1994, p. 51).

As more data were generated over succeeding lessons, more reflections and observations were also generated. These were typewritten within a day, or at the most two days, after each lesson. These documents posited observations, themes, issues, questions and ideas regarding the information gleaned from the student. They not only considered the recently completed lesson, but also the course of the next lesson. In other words, within the theme of note-taking, the reactions of the students influenced succeeding lessons. My ongoing interpretations of student progress, both successes and difficulties, had an impact on the ensuing nature of the intervention. Some topics required additional practice; others required alternative teaching/supports; others yet, were abbreviated due to student mastery. My lesson plans and written observations all recorded this information.

To assist with organizing the vast amounts of material that this entire process generated, all materials were dated. In addition, all material relevant to each particular lesson was labeled with the name of the participant.

A qualitative, computer scoring program was not used for several reasons. First, observations, reflections and student work samples do not necessarily lend themselves to such an analysis. Second, students with Asperger's syndrome, while often possessing an extensive vocabulary, do not use words well in

expressing feelings or abstract thoughts. So, a program that analyzed individual words or short word units would probably not capture the participant's intended meaning. Third, an on-line critique (Este, Sieppert & Barsky, 1998) on the success of using a computer program for qualitative scoring suggested that such an approach to data analysis might not be very promising. Students doing qualitative research for master's theses and doctoral dissertations often used the program QSR.NUD*IST 3.0 to analyze their data. Most participants ultimately resorted to manual scoring techniques. The computer program reviewers indicated that such programs seemed to require considerable training and practice in order to be effective. Not having had either the training or the experience, I did not attempt to use such a program. Finally, examining and tallying huge amounts of tiny bits of data (individual words) could be considered contrary to the original nature of phenomenology. Understanding the entire phenomenon was the goal. While the parts contributed to the whole, focusing primarily on the parts might actually cause me to lose my holistic perspective.

Information was further analyzed or organized by techniques described by McMillan and Schumacher (1997, p. 515). The techniques chosen depended upon the nature of the material collected. These techniques included: (a) asking questions such as who, what, when, where or how, and (b) identifying 'red flags' by "questioning the assumptions people make" (McMillan & Schumacher, p. 515). Other techniques were (c) applying a flip-flop technique--comparing the information to an opposite situation; and (d) comparing the data to a similar or far out situation.

The next step in the analysis was to organize the data in order to identify themes or explanations. Common threads were sought. Comparing potential themes over time and between the child's responses and the adults' perspectives was helpful. Feedback from the classroom teacher, the teaching assistants and the clinicians also confirmed or negated the accuracy and the degree of importance of the identified themes.

Throughout the process, I consulted with my university advisor. Explaining the process and progress of the research deepened and clarified my understanding.

Re-Creating the Experience

Lastly, I took a narrative approach to consolidate and share my understanding. Such an approach approximated Miles and Huberman's 'vignettes' (1994, pp. 81-83).

> A *vignette* is a focused description of a series of events taken to be representative, typical, or emblematic in the case you are doing. It has a narrative, storylike structure that preserves chronological flow and that normally is limited to a brief time span, to one or a few key actors, to a bounded space, or to all three (Miles & Huberman, p. 81).

When writing narrative research, the author carefully must weigh the balance between the situation and the details used to portray the whole (Connelly & Clandinin, 1991). The author must also decide which details or anecdotes best represent the key theme(s). "It is the particular and not the general that triggers emotion and moves people" (Connelly & Clandinin, p. 135).

Since the research was designed to develop, not only knowledge of instructional strategies, but also emotional knowledge and empathy, the

particulars were carefully chosen. I needed to consider what best conveyed the experience of the participants.

Reliability and Validity

These issues were addressed through a variety of means. Triangulation or comparison of information from the child and his other teacher was particularly useful (Gay, 1996). Similarly, data collected from the student with Asperger's were compared to the data collected from the other boys in the group. While these other students could not be considered an average cross section of teenage boys, they nevertheless displayed a variety of reactions and progress that could be used for comparative purposes.

Two other useful techniques employed were a comparison of the collected data to the medical diagnoses and feedback from experts including the university advisory committee. One of the committee members was a clinical psychologist who was an expert in Asperger's syndrome and familiar with the setting, another was a university professor who was an expert in special education and the third member was a university professor who was an expert on literacy. In addition, I received continuous support and advice from two clinicians from the Child Guidance Clinic, a school psychologist and speech and language clinician, and a reading clinician. Consultations with these experts assured that high standards were met in each area of study.

My own background knowledge and previous research also helped to interpret the effectiveness of the strategies implemented. For example, I began teaching at the treatment center thirteen years ago and taught in a variety of

settings for longer yet. I completed over eight years of post-secondary education, including a special education certificate.

At the same time, the most likely flaw in the reliability of the research was my own knowledge and previous experience. Biases could conceivably have distorted the data analysis. However, precautions were taken, namely regular consultation and collaboration with the school psychologist and the reading clinician from the Child Guidance Clinic. In addition, my awareness of possible bias helped to guard against it.

Background Information

Part way through the first term of the 2000/2001 school year, the homeroom teacher who worked with a small group of four adolescent boys requested that I help to develop their writing skills. For the group as a whole, writing was the most challenging of the 3 R's—reading, writing and 'rithmetic. In addition, the homeroom teacher's main areas of expertise were mathematics and science. Requesting resource support for English language arts generally, and writing specifically, was a practical solution to meet the needs of these boys. The strategies and teaching suggestions I offered to the teacher, while useful, did not seem to be sufficient in either supporting the teacher or in significantly improving the writing skills/engagement of the students. Timetabling conflicts arose which prevented me from supporting the teacher in the classroom. Thus, I began to teach this group three days a week for 45 minutes each day.

University Assignment

Also during the 2000-2001 school year, I was enrolled in the course

Seminar and Practicum in Clinical Reading Diagnosis and Remediation at the University of Manitoba. A partial requirement for this course included the development of a "Diagnostic Profile" (Zakaluk, 2000). This entailed writing a paper regarding various models of reading difficulties and their etiologies; designing a comprehensive outline of all the areas of diagnosis that should be considered in a full-scale clinical report; completing a minimum of three full-scale diagnoses, including detailed recommendations for corrective-remedial intervention; researching, in depth, a specific remedial procedure; and, tutoring students using appropriate diagnostic and remedial procedures. The tutoring portion of this assignment required planning and record keeping, delineating the "objectives, materials used, results, and [the] interpretation of performance and behaviour" (Zakaluk, p. 13). The instructor periodically reviewed these tutoring logs, visited the classroom and my students, and discussed the various remedial procedures used.

I had chosen to tutor the adolescents I was already supporting at the treatment center. Assessing and teaching students were aspects of my role as a resource teacher. Thus, I had ready access to students who required such services independent of any course requirements. The small group of four male students I had already begun to assess and teach appeared ideal as case studies. Each one required assistance to develop skills and strategies that would allow him to be successful in a community school setting. Researching and monitoring remedial procedures could only help to improve the service I was providing.

Chapter 5 describes the participants in the instructional intervention, with more detailed information pertaining to Jeff, my case study.

CHAPTER 5

PRE-INTERVENTION STUDENT DATA

Although the setting and the theme have been established, the characters must also be developed before beginning the narration. The main character, Jeff, and his cohorts, the other students, should be understood in order to make sense of the events as they unfold. Their personalities and their functioning levels strongly influence the story. The characteristics of the group, pre-intervention assessments, Jeff's strengths and limitations, and analysis of earlier lessons all provide a framework for the selection of the intervention and the nature of its evolution.

Group Characteristics

The characteristics of the group are important for several reasons. The other members of the group provide contrasts to the teenager used for the case study. Second, social interactions are an important domain for students with Asperger's syndrome. While the social milieu was not directly studied in this research, learning in schools generally occurs with other students. Also, adolescents with Asperger's still desire to interact socially even though they may not always have adequate skills to do so. In addition, many adolescents with this disorder may consciously and deliberately observe others, seeking patterns for social behaviours (Attwood, 2000).

Group Behaviours

This small group of boys displayed a variety of difficult behaviours from the onset. All of the boys, except Jeff, had very short attention spans. Two of the boys had very weak impulse control. They blurted out thoughts spontaneously, frequently negative in nature. One boy spoke non-stop. Another was too active to stay in his assigned seat and had difficulty respecting boundaries. Bumping into others and touching their possessions aroused antagonism in the others. Another was passive and non-active, waiting for other students or the teacher to direct his activities. Jeff, the student with Asperger's, would alternate between being highly passive and resistant, and being an observer who encouraged misbehaviour in others by laughing. One of the impulsive boys became the class clown/leader; the other became the scapegoat. In a community school setting all of these boys would have been the outcasts or scapegoats. Here the pecking order changed. Despite having an understanding of the pain of being "picked on", most of the boys were actively engaged in "picking on" the perceived weakest member of the group. Most of the boys were happy to be in a situation where they were accepted by their peers and could make friends.

Many desirable student behaviours were also lacking. At various times all of these boys displayed difficulties with attendance and punctuality. Three of the boys needed considerable direct instruction to master the use of their lockers. None of them brought their binders, pens/pencils to class on a regular basis. They were all more likely to demand that a teacher or a teaching assistant get them a needed supply than to take the initiative for collecting their own materials.

Academic Orientation

Intrinsic motivation for academic learning was virtually non-existent. Three of the four boys had long histories of school difficulties and failures. Avoidance mechanisms ranged from complete passivity to angry outbursts. All of the students displayed fine motor deficits and three of the four were highly avoidant of any written tasks. Listening was extremely difficulty for this group. Two of the students interrupted continuously and three became inattentive very quickly. On some days, instructions for activities needed to be given to each student individually while in immediate proximity to the student and while ensuring that eye contact was maintained.

Aptitude/Achievement Discrepancies

While these boys displayed a range of cognitive abilities, none could be considered cognitively disadvantaged. All of these boys were underachieving academically; although the areas and degrees of underachievement varied from student to student. All but one of the boys displayed significant deficits in the area of writing, both in terms of aptitude/ achievement discrepancies and in terms of curricular expectations. A couple of the boys were writing sentences comparable to grade two and three students. Instructional reading levels ranged between grade five and upper high school levels. For the group as a whole, mathematics, while weak, was less of a challenge than English language arts. Most of the boys found computation skills more difficult than the ability to solve every day mathematical problems.

Social Skills

All of these boys displayed social limitations. In addition to the social skills previously described, various individuals displayed further limitations: inability to initiate a conversation, poor hygiene, difficulty taking turns, difficulty conversing on a variety of topics, poor organizational skills, poor self-regulation and lack of flexibility. Some of these boys exhibited control issues (e.g. defiance) and others expressed anger and frustration through their behaviours. Inadequate social problem solving was a concern for each one.

Pre-intervention Data Collection

I used a variety of means to assess the strengths and limitations of individuals within this group. Initially, I read each student's provincial educational cumulative file and medical treatment chart.

In this setting, teachers were able to review medical charts for information that is helpful in working with students. For example, assessment reports completed by psychologists or occupational therapists were available. Treatment workers and group leaders contributed chart information that described functioning levels, treatment goals and plans, and progress reports. Social workers who had collected a variety of background data on behaviours and academic progress through contact with previous schools and organizations, such as the Child Guidance Clinic, were also consulted. Such information provided rich background information on the students: strengths, limitations, aptitudes, behaviours, social skills, school and family histories, and functioning levels. Usually missing were current academic achievement levels, unless some

achievement testing was included in the psychology report.

I also began to assess the students using a combination of standardized and informal, classroom based assessment tools. I worked with each teenager individually using a mixture of interviews, informal reading inventories, and subtests from the Woodcock-Johnson Psycho-Educational Battery-Revised (1989). In the classroom, I observed responses and analyzed pieces of work. The students also completed at least one informal learning styles inventory.

In the past I have found that learning styles inventories have not only provided me with useful information regarding students' learning styles/preferences, but also have helped students develop some awareness of themselves. Sometimes student self images are distorted. For example, some students with weak auditory processing skills actually talk a lot; possibly verbal repetition and rehearsal assist these students. They may view themselves as auditory learners when that mode is not particularly effective for learning. Frequently students are surprised when they begin to understand that each individual learns differently. With no negative associations associated with any of their preferences, some students have actually become somewhat more understanding and tolerant of their peers. An inventory, because it is personal, is often a motivational activity. In addition, such inventories are not intimidating since the primary responses are either checkmarks or number rankings rather than long written responses. While these students seemed to find the inventories interesting, their social skills appeared to be so deficient that I noticed no particular improvement in their tolerance for each other.

I also gave the student's a note-taking pre-test. I selected a piece of writing called "Earthquakes Rock the World!" by Saffer, from Gage's grade 7 anthology, *Crossroads* (2000, pp. 184-185). Earthquakes could conceivably be studied in language arts, social studies or science. I hoped that the students might find the topic interesting. I also thought it would be current, as there had recently been a serious earthquake in El Salvador. Since the article was in a grade 7 anthology, it could be considered a reasonable assignment for any of these grades 7 through 9 students. The article incorporated headings, a picture, a map and a chart, all of which could provide the students with additional information. The print was large and the text made good use of white spaces and colour. The piece consisted of three pages or nine paragraphs (including graphics), not particularly long as a typical note-taking assignment, but long enough to assess note-taking skills. Since the anthology had been recently published, the students were not likely to have been exposed to it.

First, I explained the purpose of a pre-test—to assess what skills they might already have prior to instruction. Then, I asked the students to read the article and to make notes from it. I explained that any style of note-taking was acceptable, but that they needed to record the essential information from the article. When all of the boys displayed difficulty putting words on the paper, I suggested the two-column format—main points in the left hand column and supporting details in the right hand column.

All of the boys floundered and none completed the task. One boy wrote random phrases, another began to copy every sentence and a third refused to

write anything. With a teaching assistant's help, that student eventually agreed to underline some key points on a photocopy of the article. At first, Jeff refused to write anything, either on paper or on the computer. The school psychologist worked individually with Jeff and with support coaxed some phrases from him that he keyed into a computer. Unfortunately, when Jeff was asked to remove his cap, he promptly deleted all that he had written. "No hats or jackets to be worn in class" was a strict rule of the homeroom teacher and he had just entered the room. Regardless, neither Jeff nor any of the other students displayed any particular knowledge of note-taking.

Description of Jeff

Background

Jeff lived with a younger sister and both parents. As a toddler, Jeff was slow to walk and talk. He was diagnosed with PDD in 1998 when he was twelve. Jeff's parents believed that they shared qualities with their son. Dad believed that he had Asperger's syndrome and Mom had indicated that she was shy and withdrawn.

The Child Guidance Clinic became involved in kindergarten when Jeff displayed difficulties participating and interacting with peers. Initially he was offered support from the school social worker. Speech and language and psychology supports began in 1994. Speech and language services were withdrawn in 1997 when Jeff refused to participate. He received supports throughout much of his schooling from teaching assistants, special education placements and resource outside of the regular classroom.

Characteristics

Jeff displayed many of the characteristics commonly associated with Asperger's: social isolation and withdrawal, stubbornness/rigidity, avoidance of new situations, low frustration tolerance, socially inappropriate behaviours and conversations, social anxiety, hypersensitivity, emotional outbursts, poor eye contact, weak organizational skills, preoccupation with limited interests, visual/motor integration difficulties, awkward gait and poor fine and gross motor skills.

Examples of these characteristics were displayed regularly. Withdrawal might entail physically leaving a setting or might be evidenced by refusal to engage, particularly with adults. In the classroom, Jeff became particularly rigid and non-compliant when asked to remove his cap and when asked to write. When he did agree to write, he awkwardly printed a minimal number of words, using considerable pressure on his pencil. Jeff had difficulty participating in new or unusual activities. He refused to come to the centre when too many field trips or new outings had been planned. Jeff's hypersensitivity was evident in his choice of clothes and his refusal to eat most foods served at lunch. For example, he had outgrown his favourite, soft sweatshirt, but continued to wear it. While Jeff's social skills were delayed, they were developing. He would initiate "parallel play" type activities. In other words, he played with his Game Boy beside another boy who was doing the same thing. In class, when he and another boy were enthusiastic about developing a Pokemon quiz for staff, they chose to write separate quizzes at different computers rather than develop one quiz

collaboratively. Jeff was beginning to enjoy more cooperative, yet structured, activities such as board games and Game Boys with dual controls. Many of his socially inappropriate behaviours faded over the year (e.g. raspberry noises, sounds of flatulence and nose picking).

Unlike most students with Asperger's, speech was challenging for Jeff. He displayed both vocal tics and poor articulation. When stressed, the tics increased and he seemed to stutter when he attempted to talk. More often he used grunts, shrugs and short phrases such as "maybe," "I'm not telling" and "I don't know" to communicate. He might put his head on his desk and remain mute. When he did speak, his voice was generally quiet. However, he became verbally engaged and animated when the listener participated in a discussion about Pokemon or Game Boy, topics on which he was an expert.

Jeff had other unique characteristics. He possessed entrepreneurial inclinations. He had been making beaded Pokemon figures and had managed to sell these to a surprisingly large number of staff and students. He was quick to negotiate for higher prices for more popular pieces and to negotiate volume discounts. Jeff had a sense of humour; although, sometimes his humour had an edge. Jeff was reprimanded for making sarcastic comments and for laughing when others made foolish comments or errors. Nevertheless, he responded well to humour and could sometimes be cajoled into cooperating. He observed interactions within the group and made attempts to be similar. For example, on one occasion the other three boys had all been reprimanded for misbehaviour. At the end of the class, after the others had left, Jeff informed me that he would

go home, teach his "Furby" to swear, and bring it to class the next day. He laughed when I asked him if he had felt left out when the other boys were getting into trouble. Jeff could also be quite competitive, deliberately serving a badminton birdie to a point where it could not be returned, or changing the rules in a board game when a new player joined the game, or rushing to be the first one to complete an activity that he knew he had mastered.

Educational Assessment

Information included in this section reflects a compilation of data from psychological and occupational therapy assessments, as well as formal and informal assessments that I employed in my role as the resource teacher. All of the data was current, based on testing and observations that had occurred within the previous year.

Learning Styles

Informal, self-administered inventories suggested that Jeff was an auditory and tactile learner. An inventory for multiple intelligences indicated that Jeff's greatest strength was in logical/mathematical thinking. Jeff's progress in math classes confirmed this strength.

Interests and Motivation

Jeff was highly interested in Pokemon, Game Boy, computer games and beaded Pokemon crafts. When his interests were incorporated into classroom activities, Jeff was much more likely to be engaged, more willing to read, write and discuss. Otherwise, Jeff was easily frustrated and would readily discontinue

tasks when he was unsure of his own skills or when he was unsure of the exact nature of the task.

Aptitudes and Abilities

Results from the WISC indicated that Jeff's verbal abilities were at the 42nd percentile and his visual-motor/spatial abilities were at the 37th percentile. Both of these scores reflected functioning levels within the average range. Particular strengths included mental math abilities (75th percentile) and maze problem solving (99th percentile,). He also displayed high average sequencing abilities. Areas of relative weakness included social comprehension and judgment (16th percentile) and processing speed (2nd percentile). Test results from the Woodcock-Johnson Psycho-Educational Battery—Revised (WJR) provided additional information. Fluid reasoning (non-verbal, logical thinking) appeared to be a strength at the 89th percentile. Memory abilities (46th percentile) and general comprehension-knowledge (40th percentile) appeared to be average for his age. Processing speed (24th percentile) and auditory processing (23rd percentile) were somewhat weaker. These last two results would have been negatively affected by Jeff's weak fine motor skills and by his speech difficulties. As well, the occupational therapist found that Jeff demonstrated poor organizational skills and low efficiency in carrying out tasks, primarily due to the tendency not to follow instructions accurately. She also found that his thinking was more concrete than abstract.

Generally, Jeff was able to perform very well when requested to perform concrete, analytic and sequential mental problem solving. Most of his remaining

abilities seemed to fall within the average range for his age with the notable exceptions of scores in social comprehension and processing speed. Processing speed tests results might need to be viewed cautiously. In this instance, the results likely revealed how quickly or effectively Jeff could respond physically or verbally to stimuli rather than how quickly he could make mental sense of the stimuli. As both his motor and speaking skills were weak, the scores were not likely indicative of his thinking speed. However, they did provide useful information in that they suggested Jeff required extra time to respond to directions in a classroom setting.

Language/Vocabulary

Jeff's difficulties in expressing himself verbally made assessing his abilities to understand and use language for thinking and communicating quite challenging. For example, when Jeff attempted to provide verbal responses to some test questions, his tics and stuttering increased to the point where he was unable to verbalize what he wanted to say. The formal testing undoubtedly increased his anxiety. As a result, this testing was discontinued.

Sub-test scores from both the WJR and the Wechsler Individual Achievement Test (WIAT) were used to assess Jeff's language abilities. Scores for various short answer vocabulary or language based tests ranged between the 22nd and 74th percentiles for his age. Listening comprehension appeared to be a strength (74th percentile, WJR), while his oral vocabulary (57th percentile, WJR) and word recognition (reading isolated words, 55th percentile, WIAT) appeared to

be solidly average. However, he appeared to have more difficulty retrieving words from memory to match presented pictures (22nd percentile, WJR).

Achievement

Reading, math and written language were the three areas assessed. Overall results indicated that Jeff's reading and mathematical abilities ranged between average and low average levels; however, his broad written language score reflected a severely deficient functioning level.

Reading. Jeff's overall reading abilities appeared to be average (42nd percentile). His reading comprehension seemed to be low average (18th percentile), while his reading skills seemed to be average (46th percentile). His reading skills score was made up of an average score in letter-word identification (73rd percentile) and a low average score in word attack skills (17th percentile). Jeff's difficulties with speech might have accounted for at least some of his poor performance in work attack, as this required phonological processing and making sound-letter associations. However, at his age, communication and therefore comprehension would be the most critical aspect of reading.

Mathematics. Near the beginning of the school year achievement testing using the WIAT was completed with the psychologist. Results indicated that Jeff's mental math abilities were strong (75th percentile); his math reasoning was average (37th percentile); and his computation abilities were weak (5th percentile). In the latter half of the school year, testing with the WJR indicated that both his math reasoning (53rd percentile) and his computation abilities (25th percentile) were within the average range. Improvements might have been due to any or all

of improved skills, greater comfort levels, greater effort (competition with peers) or different tests. The homeroom teacher felt that Jeff had made considerable progress in math during the year.

Written language. Scores in this area (1st percentile) revealed the greatest deficits. Jeff's writing skills (13th percentile) tested at low levels. Writing skills included the subtests for punctuation/capitalization (7th percentile), spelling (25th percentile) and word usage (42nd percentile). However, his weakest score was in written expression (0.1 percentile). Jeff refused to continue the test when more than a few words were required, even though he was likely more capable.

Unfortunately, these test results paralleled Jeff's reactions to written assignments in class. When he did write, he printed using large letters. He omitted punctuation and had difficulty leaving spaces between words. Letter slants varied and he used considerable pressure on the pencil. He had difficulty aligning the letters with lines on the page. Nevertheless, Jeff's printing was legible and reading his material would not be unduly difficult if he were to write more. However, he seemed to be embarrassed by his writing, giving up easily and hiding the small amount he did complete.

Keyboarding seemed an obvious adaptation. In fact, an earlier school had arranged for Jeff to have keyboarding lessons. After a period of time, he refused to continue the lessons. Several computers were in the classroom in which we met, yet Jeff usually avoided using them for writing.

Quite likely a number of factors made writing particularly difficult. Weak organizational skills, weak word retrieval, deficits in flexibility and social

imagination would combine with weak visual-spatial abilities and weak fine motor skills to make the entire writing process overwhelming.

Several factors needed to be considered in helping Jeff improve his writing. He needed to be comfortable enough to take risks and try difficult tasks that he had avoided in the past. Also, the process of writing needed to be broken down into smaller, more manageable, component steps. These steps frequently have been labeled as pre-writing (e.g. brainstorming, researching, vocabulary development), writing a rough draft, revising, editing/proofreading and publishing/sharing. Pre-writing activities and the use of graphic organizers seemed appropriate instructional strategies to emphasize.

Pre-Intervention Instruction

The lessons I planned when I first began working with this group were short and well structured. They included making vocabulary maps, journal writing, using learning response logs, compare/contrast graphic organizers, paragraph frames, sentence combining and teaching spelling.

I hoped to provide a sufficient number of success experiences to improve self-confidence, and to develop positive risk-taking. Short, structured activities were to be re-assuring, concrete and safe. Graphic organizers, paragraph frames, examples and modeling were designed to make these tasks understandable, less open-ended and less threatening. Pre-teaching activities, such as vocabulary instruction, the use of visual displays, discussions and modeling were implemented in order to prepare students for the assigned tasks. I provided much of the organization required to produce their written work; thus,

reducing some of the complexity of writing. Computers were offered to help the boys produce more attractive finished products and to remove some of the frustrations associated with poor fine motor skills. Since most of these boys were quite grade conscious, I primarily assigned marks for processes rather than products. In other words, rather than marking the appearance and quality of the completed writing tasks, I assigned marks to items such as time on task (thinking and writing time), quantity of writing (based on increased numbers of lines or sentences), inclusion of "who, what, where, when, why and how" responses (increased written content) and completion or thoroughness of responses. I searched for positive attributes, such as good word choices, interesting sentences, inclusion of all of the "5 W's and how," plenty of details, increased quantity, and displays of knowledge/expertise. Then I praised the students both verbally and through written comments, using specific examples. I focused on helping the students to communicate through writing (words on paper/computer) rather than critiquing the mechanics or writing styles. The teaching assistants and myself participated in and demonstrated many of the writing activities, such as journaling and completing learning logs. Afterwards, students as well as staff were invited to share their work in an effort to validate and model these tasks. In short, I used as many strategies as possible to reduce the intimidating aspects of writing, to support the writing process, and to reward any improvement in written responses. Then I persevered with these activities knowing that the weak skills and the negative attitudes of these students were well entrenched and would require considerable time and practice to improve significantly.

Many of these strategies were less effective with these students than they had been with other weak and learning disabled students I had taught. For example, problems with attention, impulsivity, compulsion to talk and hyperactivity disrupted pre-writing activities. I was rarely able to read even a short, motivational piece to this group without several of the boys commenting on related topics, moving about the classroom, ridiculing each other, playing with objects within their grasps or interjecting with irrelevant concerns.

Taking turns in a discussion was a skill that no student in this group had mastered. Jeff was often mute and the other students usually spoke simultaneously and were frequently off topic.

Giving instructions/information at the beginning of the class was a problem throughout most of the year because individual students often arrived at different times for class and had additional difficulties preparing themselves for the upcoming activities. Time management was a problem for most of the students. Some of the boys would be deliberately late in an effort to avoid a difficult task. Some of the boys were more interested in socializing during the lunch hour than in attending class. These students would sometimes arrive late or would skip classes altogether. Although this was undesirable, it was also understandable, since many of our students were outcasts in their previous schools. A couple of the boys had real difficulty reading clocks and estimating the time required to complete activities prior to the start of class. Those same boys continued to have difficulties opening and organizing their lockers, arranging their backpacks and supplies, and remembering what was needed to begin different classes.

Posted checklists, verbal reminders and rewards (including chocolates) had minimal impact.

Group pre-activity exercises needed to be short and concise, with visual, verbal and activity-based input whenever possible. The teaching assistants and myself had to be prepared to provide additional, close-range, individual supports for the students unable and/or unwilling to partake in small group instruction. Often either the school psychologist and/or the school reading clinician provided additional one-to-one support and instruction.

Pre-Intervention Planning

Planning remedial strategies for this small group required thought. I considered student needs, strengths, limitations and functioning levels. I also had to consider the typical expectations of the community school in which they would later be placed. I wanted to teach strategies that could be generalized across subject areas and life experiences. The benefits of the learned strategies should warrant the efforts required to master them.

Meeting Student Needs

The initial work that I had done earlier with this small group gave me considerable background information regarding the needs of these students. I had learned that these students required assistance with organization. They needed help to organize information, ideas, time and possessions. The acquisition of organizational skills would support these students in all subject areas and in all walks of life. Understanding relationships between ideas and pieces of information would not only assist with organization skills, but would also

support memory development (Frender, 1990; Anderson, 1994). Teaching these teenagers to use schemata to link new information to prior knowledge would not only assist with recall, but would also develop comprehension and cognition (Anderson, 1994; Pearson, & Camperell, 1994; Bransford, 1994; Tierney, & Pearson, 1994).

I wanted to teach these students strategies that would serve them well in a variety of subject areas across all future grade levels. Whatever strategy I taught should help to make them more independent learners. The skills should help them to learn from texts and discussions, with less reliance on adult (teachers, teaching assistants and parents) and peer support. The strategy would need to be almost universally useful, flexible to accommodate a variety of contexts, and sufficiently concrete and structured to be mastered by the individuals within the group.

Reflections on the Intervention Process

Earlier work, including journal responses, developing vocabulary maps, graphic organizers and paragraph frames informed the new intervention. Journal writing was a task I had frequently used with reluctant writers. Many such students worry about the appearance and quality of their work and as a result, do not have enough practice committing thoughts to paper. Encouraging the expression of ideas, humour and descriptions through writing while ignoring penmanship, spelling and grammar often helps students to develop writing abilities. I encourage students to write about responses to relationships, thoughts about issues and reactions to experiences (Johnson, 1996). Modeling

and sharing responses while focusing on the positive attributes of those responses can lead to improvements in both the quality and the quantity of written expression.

Most of the members of this particular group of students were highly reluctant to write journal entries. Understanding the purpose of this activity did little to motivate them. When encouraged to write "anything that pops into your head" (Johnson, 1996, p. 56), the common reply was "I can't think of anything". Because idea development was so challenging, I encouraged the boys to be more concrete, to list and describe recent activities. Most of the students responded with phrases, merely listing activities. In order to expand their lists, I requested that they use sentences and elaborate on their responses by including information relating to "who, what, where, when, why and how", as suggested earlier in the grading incentives. Eventually all of the boys improved their writing, but growth was slow. Using sentences and providing descriptive details remained as learning objectives.

Jeff was particularly avoidant despite the availability of a computer, plenty of encouragement and support regarding writing topics (including Pokemon). For over a week, his entries amounted to "This sucks," and "This is boring". When I assigned marks for the number of lines written, he programmed the computer to repeatedly copy "This is boring". I adjusted the marking schema to reward numbers of new/original sentences. After several weeks, Jeff did begin to write a few simple sentences. I had learned that providing a rationale for an activity did

not necessarily make that activity meaningful for Jeff and that marks did motivate Jeff. In addition, both his intelligence and his rigidity were confirmed.

Using vocabulary maps seemed to be somewhat more successful (Manitoba Education and Training, 1996; Diagnostic Learning Centre, 1997). A dictionary definition and a synonym could be copied, and only one original sentence was required per new word. However, when asked to draw a picture of the word, only the student with adequate writing skills participated willingly. Jeff refused to even attempt a drawing. Nevertheless, he was able to fully participate in the remainder of the exercise. I discovered that these students could complete short tasks when given clear and precise directions. Vocabulary work was more successful than work that required greater skills in either organization or creativity. Expectations in regard to creativity and the use of fine motor skills should be limited in order to encourage participation. For the students with Asperger's, this was no surprise. For such students, word knowledge is generally superior to comprehension and most artistic/creative endeavors are difficult or impossible.

Originally I had planned to teach these boys to use various graphic organizers and framed paragraphs to organize and structure their writing (Vacca, & Vacca, 1999; Manitoba Education and Training, 1996, 1997 & 1998; Buehl, 1995; Wisconsin Department of Public Instruction, 1989). Providing frames would also help them to understand text structures; thereby facilitating reading comprehension.

Paragraph frames are usually an excellent means of teaching most students how to organize a piece of writing. "By providing students with significant textual organizational cues, students are guided to recognize and use the frames that are appropriate to the material being studied" (Wisconsin Department of Public Instruction, 1989, p.175). All or part of both topic and concluding sentences are provided, as are the beginnings of key sentences that develop the topic sentence. Transition or signal words are also inserted. Students supply the remaining information. Practice allows the frame to act as a formula for a specific type of writing such as compare/contrast.

In the past, I had observed that students with attention and auditory processing difficulties were quite successful with this strategy. The frame provided direction, structure and prompts. This almost guarantied success for students who would have had difficulty learning through oral instruction alone.

Despite my early optimism, teaching compare/contrast graphic organizers and follow-up paragraph frames took a great deal of time and still met with limited success. Samples of the forms used can be found in Appendices G and H. All of the students could complete the graphic organizer when given two well-known topics to compare (e.g. trucks and cars, cats and dogs, birthdays and Christmas); however, only two of the four students were either willing or able to complete the paragraph frame. Jeff refused to attempt the frame, even on the computer. Creating and organizing sentences was too much of a challenge for these students. Also, perhaps the length of the frame that I provided was intimidating. Finally, I would not likely have enough time to help each student to master the

collection of text structures and associated graphic organizers that they would need in order to master the most common forms of writing (e.g. description, compare/contrast, series of events, problem/solution and cause/effect; Vacca & Vacca, 1999; Wisconsin Department of Public Instruction, 1989).

The writing task would need to be shorter to ensure success, perhaps only phrases or single sentences. At the same time, the task would need to be age-appropriate or the students would become insulted and unmotivated.

A spontaneous activity that evolved out of a classroom discussion showed that Jeff was more capable than most of his classroom work revealed. The discussion began with Pokemon and progressed to a discussion of student expertise on topics about which teachers and teaching assistants would be ignorant. The subsequent quiz that Jeff wrote to test staff's knowledge of Pokemon was composed of ten simple, yet well-written questions. When inspired, Jeff was capable of writing a series of complete sentences. Unfortunately, he was not able to do so in a collaborative fashion. Jeff, and the other student who was similarly inspired, did not seem to understand how they could work together, despite my encouragement. Instead, they independently produced separate products across the room from each other. Collaborative work, while still a long- term goal, was not yet feasible. Small, incremental steps would need to be designed to work towards that goal.

These preliminary instructional activities all contributed to my decision to pursue note-taking as an appropriate intervention that is described in Chapter 6

CHAPTER 6

INTERVENTION REFLECTIONS—THE STORY

By the end of January 2001, I was ready to begin the note-taking intervention. The students and I were already familiar with each other. I had collected background information, consulted with other staff, assessed the students, analyzed previous lessons and researched relevant literature and resources.

Format for Strategy Instruction

Whenever possible I used Swanson and De La Paz's "Self-regulated strategy development model for teaching strategies" (1998). This is a seven-step model. A summary of the model can be found in Appendix I.

1. Describe the target comprehension strategy.
2. Activate background knowledge.
3. Review current performance level.
4. Model strategy and self-instruction.
5. Provide collaborative practice.
6. Provide for independent practice and mastery.
7. Invite generalization.

Initial Note-Taking Instruction

First, I introduced note-taking as our next theme. I explained that note-taking would prepare them for high school and college. The students were able to identify a range of subjects where note-taking would likely be useful. They all

appeared to be quite motivated. They were interested in being able to master skills that could be associated with higher grade levels. In the past they had often been given work that was more simplified than their peers; so, this was a refreshing change.

Then I began tapping the boys' prior knowledge. They were able to identify a variety of ways that they already took notes, such as, telephone call notes, shopping lists, information lists re computer games (Jeff's contribution), and "to do" lists. Familiarity with the theme seemed to reduce the anxiety that students with learning difficulties often experience when confronted with an unknown or new concept. Recalling background information also allowed the students to establish a knowledge baseline on which they could build new knowledge.

In order to ensure success, I wanted to structure tasks to guarantee mastery. Concepts would need to be broken down into small steps. Supports would need to be substantial initially and would gradually be withdrawn as students displayed competence. In other words, I planned to use scaffolding to promote learning. First steps would be short, simple and sufficiently supported to help the students develop foundation skills and to bolster self-confidence. It was clear that these students would not be able to complete a note-taking chart until they had mastered determining the main idea of a paragraph and selecting supporting details. Thus, I chose to start with portions of Harper's "A Sequential Notetaking Program for Intermediate Grades," (1979).

I explained to the students that not all material they would use to make notes would be well written or easy to analyze. Sometimes extra, nonessential

information is added and at other times no clear topic can be easily identified. We would begin our work by learning to recognize extraneous material. We began with lists of words where one word did not fit. Jeff and the other students all participated and had no difficulties crossing out the inappropriate words. Then we progressed to categorizing lists of words. I asked the boys to supply an "umbrella term" to each list of words they were given. Again, all the students participated successfully. For the most part, the students were able to stay on task, despite much verbalization.

Before progressing to sentences, we reviewed the 5 W's and H (who, what, where, when, why and how). The students had learned to use these words as prompts to expand their journal writing pieces earlier in the school year. As a group, they were able to recall all of these prompts and to supply examples. I explained that these same words could be used to select important details in a paragraph or article.

I modeled the next task. After examining a topic sentence, I used self-talk to consider several possible supporting details. I used the 5 W's and H to create those details. Then I wrote on the blackboard three sentences that supplied additional information regarding the topic sentence. The students had difficulty paying attention; so, I skipped practicing the task with the entire group and assigned each boy the task of providing three supporting detail sentences for several topic sentences. They virtually all stopped participating. They were unsure of the task requirements. Yet, when I backtracked and tried to complete practice sentences with group participation, the students again experienced

difficulty listening and staying on task. Several spoke at once and sometimes off topic. Since we were richly staffed that afternoon, I asked staff to provide individual assistance to each adolescent.

Jeff appeared to be the only student in the group who observed the lesson carefully. Still, he refused to talk or to write any responses to this assignment despite one-to-one support. He also refused to use the computer or to use a staff member as a scribe. I considered several possible reasons for his lack of response. Jeff may have been "stuck" and unable to continue once he viewed the task as unmanageable. He might also have found the concept of topic sentence and supporting detail sentences difficult to understand. The psycho-motor task of writing combined with the task of sentence creation may have been over-whelming. He may have been uncomfortable talking when relatively unknown staff were present (the school psychologist and the reading clinician). He also may have refused the offer of the computer or scribe in order to be the same as the other students. Another possibility was that Jeff did not want to display work that might be considered inferior; so he simply did no work.

I reduced the scope of the next task. I aimed for a task that could be divided into quite short chunks and would require less writing. I decided to help the students develop strategies to determine the gist or primary idea of a paragraph. We read a paragraph together as an overview. Then we began to examine each sentence individually. After reading the first sentence, I modeled the selection of a couple of words from that sentence as being critical to the meaning of the sentence. We completed a couple of sentences as a group.

Then I asked the students to complete the remaining sentences individually. Since the students were able to underline words on their copies of the paragraph and no writing was required, this portion of the exercise seemed to be less intimidating than yesterday's task. However, all of the students required assistance from staff to either aid with word selection, or to encourage task completion. After the key words in each sentence had been selected, as a group I asked the students to determine the main idea of the paragraph. Some of the boys began explaining the entire paragraph. I asked the boys to narrow the topic down to one sentence. Most had considerable difficulty. Jeff wrote a phrase, more like a title than a topic sentence, but certainly a move in the right direction. He continued to use his body to shield his work and prevent anyone from seeing his writing. Nevertheless, at the end of the class, he handed in his work to me.

Changing Jeff's Courses

The homeroom teacher and I met to discuss Jeff's progress. At the time, Jeff was enrolled in mathematics, English language arts and physical education. He was making good progress in mathematics and was beginning to participate in physical education activities; however, at his present rate of progress, he would not earn the language arts credit. The teacher suggested that Jeff substitute science for the language arts course. Perhaps next year he would be more able to attempt the language arts course. Much of the material in the science course required literal comprehension only. The teacher was prepared to have Jeff read the text material and provide answers to questions by underlining and pointing to the appropriate information. The science material the

homeroom teacher was proposing to use was more simplified than the regular course material, but covered the same concepts. As the course was largely biology, the vocabulary was still challenging. Fry's (1968) readability scale indicated that the material was written at a grade 11 level. A trial chapter completed by Jeff revealed that he was quite successful with this text and this process. His ability to comprehend literal material appeared to be quite strong. I agreed that the course change was likely best for Jeff. The teacher initiated the process for changing the courses; however, I requested that Jeff continue with the note-taking unit with the other students. This unit would hopefully improve his literacy skills, particularly writing and organizing, and could also be applied in science. It could help to prepare him for language arts for next year.

Addressing Behaviours

Classroom behaviour was deteriorating. Attendance was erratic; it was rare that all four boys were present on any given day. Very rarely were even two of the four boys on time. They were arriving with jackets and toques, and without paper or writing utensils. The scapegoat's misbehaviour was increasing. He reveled in the attention his behaviour earned and used his antics to avoid work. At the same time, he desired friendship and did not know how to go about making friends. The group leader was becoming more verbose, talking continuously and displaying increased impulsivity, a greater need for attention and decreased tolerance for others. The extremely passive student shadowed the leader, angling his chair towards him, laughing inappropriately and making comments designed to win the leader's approval. Jeff, usually quiet, was

beginning to fit in—he was injecting negative and sarcastic comments into the conversations and he continued to wear his cap to class.

I decided that these students were so lacking in social skills that they genuinely did not understand the degree to which they are misbehaving. Each one was essentially egocentric, unaware of the impact that his behaviour had on others or of the consequences to themselves. They did not understand either the rules governing classroom behaviour or the importance of following them. They had limited interpersonal skills. Impulse control was lacking. These students responded to stimuli impetuously and seemed unable to self-monitor or self-regulate their behaviours. In addition, these students were highly task avoidant. Past school experiences had generally been negative, a history of failures. As a result, misbehaviour to avoid tasks was more desirable than attempting the more challenging task of compliance.

It was already February, more than half way through the school year. The behaviours had to be addressed! Time on task was presently minimal. Consequently, skill development was also minimal. In addition, the boys needed to learn acceptable classroom behaviours more than anything else in order to be successful in future community placements. Polite and respectful behaviours would encourage teacher assistance, but out-of-control behaviours would more likely engender further rejection.

Responding to the Behaviour Challenge

I introduced this new theme in a subversive fashion. I presented a new goal - learning how to manipulate teachers into liking them. Manipulation was a

highly motivating concept! We began by trying to understand what made most teachers tic. The students volunteered lists of student behaviours that teachers both liked and disliked. The brainstorming results covered the blackboard. Then we began condensing the lists into a few more general guidelines. We were back to synthesizing and categorizing. The students were unable to reach a consensus and their lists were still quite lengthy. Next class, I presented the following list as possible broad categories for keeping teachers happy: Be respectful; Be responsible; Be there/Be ready; Follow directions; Respect others' space. Their next task was to fit all of their examples into these categories.

Jeff was silent through most of these classes. He did not contribute any information regarding teachers; however, he did seem to be following the conversations. I began one class by asking students to recall as many of the rules as possible. Jeff either would not or could not write one rule.

Next, I asked each boy to discuss his own strengths and limitations with respect to each rule. I optimistically attempted to help the boys with turn-taking during a discussion. For each rule, each student would take a turn either to apply the rule to himself or to give a more general example of the rule. The turn-taking was limited, but the talking was successful. Even Jeff spoke; however, he chose to practice "put-downs" as his contribution to the "Be respectful" rule. He giggled with each peer "put-down".

I needed to nip Jeff's negative comments in the bud. Because our school was so crowded, a common practice was to have students, who need fewer distractions, work in odd spaces. The gym, teachers' offices and hallways were

commonly used. This was viewed as primarily supportive rather than punitive. So far, Jeff had been the only student in this group of four who had not been asked to work in a less disruptive environment. Since Jeff could work in spite of disruptive neighbours, asking him to leave the classroom would be viewed as punitive. Punitive measures were not generally considered effective for students with Asperger's. At the same time, he seemed to be observing the behaviours of his peers and trying to blend in with them. Not treating him in a similar fashion to the others might also give him the wrong message. I decided to send him into the hallway to work where there would be no one to "put down". He was genuinely upset and unable to do any further work that class.

The next day, Jeff arrived a couple of minutes late, but without his cap. I asked each student to create a poster for one of the rules. As we reviewed the rules, Jeff's hand went up quickly to claim the "Be respectful" rule.

Each poster was to list a rule in large, easy to read letters. Graphics or pictures could be used to visualize the rule. Students could draw, use collage materials or use the computers. Three of the four students, including Jeff, chose to create their posters on the computers. Some problems arose with the disk drives and the graphics disks. Jeff remained calm. He spoke to the school psychologist in clearly articulated sentences as he explained how he did similar problem solving with his computer at home. Few tics were evident. He printed an extra copy of one picture to take home and was late for gym class because he was reluctant to stop working on his poster.

What a fine class! I was not sure how much impact sending Jeff to the hall the previous day had on his behaviour. I suspect that the computer work and the visual components to this assignment also made the class more productive. In addition, Jeff was becoming more comfortable with the school psychologist and the reading clinician. The other students were similarly engaged with the task. A competitive flavour seemed to enter the classroom, each student trying to produce the most effective poster.

The next day Jeff arrived on time and without his cap. He complained of a sore hand from so much colouring. He was proud of his work and was willing to show it to others. His tics became a stutter as he tried to explain his work to the reading clinician. He persevered with his explanation, ignoring another student's stares and negative remarks regarding his tics. Jeff also liked being treated with chocolate covered cookies! He requested several, as did the other students.

In an effort to review the rules yet again, I planned a "Gallery Walk". Each student would be required to make a positive comment about someone else's poster now displayed in the classroom. As well as reviewing the rules for acceptable behaviour, I was planning to help the students replace negative comments with positive ones. I explained the procedure and compared it to the positive evaluations made at Toastmaster meetings. The students clearly stated that this was entirely too artificial and smacked of dishonesty. These are my words; theirs were more pointed. I had expected too much. I instantly modified the task to teacher modeling without student practice. I pointed out some positive qualities regarding each poster, focusing particularly on the effectiveness

of the graphics in clarifying the rule. Later, I used a rubric based on initial instructions to evaluate their posters and to reinforce their success. They earned marks for clear, easy to read lettering, good use of colour, correlation of rule and graphics/pictures and effort (time on task and perseverance).

Self-Monitoring

Now that the students were familiar with the rules, I needed to help them self-monitor their own adherence to those rules. We discussed the need for students to practice self-regulation in a typical classroom. In spite of their general acceptance of the worth of self-regulation, they were less than enthusiastic in regard to implementing a strategy to monitor their own behaviours. The daunting nature of the task, fear of failure and reluctance to assume responsibility for their own behaviours (vs. blaming others) all contributed to the cool reception this notion engendered. Lack of enthusiasm did not stop me from initiating a strategy I believed would serve these students well. I designed a rubric using the behaviour rules we had been learning. (See Appendix J.) I did not believe that these students would be able to work in either a cooperative or an organized fashion to create the rubric themselves. Rather, I incorporated their work. I decided to include the student-generated samples of behaviours exemplifying those rules, especially since several of the students still had difficulty explaining what any given rule entailed. A copy of this rubric is included in the appendix. The grading schema did not perfectly match the criteria; however, I did not want to use numbers, words or letters that might have

strong previous associations with either failure or superiority. The students had no difficulty understanding how the grading schema related to the criteria.

I collated several copies of this rubric in a red duo tang for each student. These duo tangs could be stored in the hanging file folders near the classroom entrance, where the students stored the rest of their daily work. Five minutes before the end of a class, the students were requested to retrieve their duo tangs and evaluate their own behaviours. A second part of this self-reflection required the students to write or list the tasks that they had learned or practiced that class.

Despite initial instruction, this task took longer than five minutes with this group. Coordinating the retrieval of the duo tangs resulted in pushing, bumping and losing materials. Physical clumsiness, poor understanding of boundaries and organizational deficits made moving about the classroom and retrieving/storing items a challenge. Eventually, either the teaching assistants or myself began handing out the red duo tangs near the end of class. The boys also required assistance in completing the rubrics, not because they didn't understand the forms, but because they either couldn't remember their own behaviours for an entire class, or because they had difficulty evaluating the acceptability of their behaviours or because they were uncomfortable acknowledging their behaviours. Despite these difficulties, I persevered with this task. It incorporated recall, self-reflection, accountability and writing, all skills that this group needed to develop. I decided to allocate more time to this task until the students became more competent.

Gradually the behaviours of the group improved even though the core problems and deficits were still evident (e.g. mental health issues, personal friendship goals superceding academic goals, learning disabilities and poor social skills). They had needed more than just hearing the rules governing student behaviours. They had needed to understand the nature of the rules, their value and the contexts associated with them. They needed opportunities to practice and receive feedback. They needed even more practice to begin generalizing the use of those rules and to begin monitoring their own effectiveness in implementing them.

Jeff had difficulty retrieving and storing his duo tang. He displayed less difficulty completing the rubric than listing his accomplished tasks. This was more likely due to the writing than the recall component. Eventually, he was able to write several words or short phrases to reflect his class work. On days when his behaviour was poor, he was most reluctant to complete the rubric, indicating awareness of the acceptability of his own behaviours.

While working on the behaviour theme, I had continued to provide some instruction and re-enforcement of paragraph organization. These students needed a variety of tasks and topics within a forty-five minute block of time. In addition, they needed to remember and practice the preparatory note-taking work that they had done. Once behaviour improved, I expanded the time allocated to the note-taking theme.

Selecting Main Ideas and Supporting Details

We tackled main ideas and supporting details in a several ways. We reviewed the 5W's and H as a means of identifying details. We wrote phrases (rather than the original sentences I had requested earlier) to provide details to support a topic sentence. We read paragraphs together and tried to eliminate sentences that were off topic. We read related sentences and created topic sentences to develop paragraphs.

I taught the boys specific rules to determine topic sentences: (1) The topic sentence is most often the first sentence in the paragraph; (2) Sometimes the topic sentence is either the second or the very last sentence in the paragraph; (3) Sometimes the topic sentence is not actually written in the paragraph and the reader must supply it—Determine the central idea of the whole paragraph; (4) Compare the detail sentences to the topic sentence to be sure that they all relate to the topic sentence. If not, either a detail sentence does not belong or you have picked the wrong topic sentence.

I modeled and reviewed; students practiced; staff prompted and encouraged. The students were still unable to select topic sentences consistently or to differentiate between topic and detail sentences accurately. Most of Jeff's answers to teacher questions amounted to "maybe", his stock avoidant response. On one occasion he offered "sheep" as a detail response to an article on dreaming. Unfortunately, there had been no reference to sheep in the article. I don't know whether this was a genuine guess at suggesting a dream related detail or an attempt to keep me either satisfied or at a distance.

Coloured Highlighting

I reviewed the note-taking literature and consulted with the school psychologist and the reading clinician. Then, I selected coloured highlighting as the next strategy to practice the selection of topic sentences and supporting details. I hoped that the reduced writing component would simplify the selection of data. I also hoped that the novelty of the coloured markers would engage the students. Once the selection concepts had been mastered, the same data could be entered into a two-column note-taking format.

I bought packages with several different coloured highlighters per package. I photocopied articles about monsters, mysterious events, weather, unusual phenomena and transportation, topics that were both non-fiction and interesting to teenage boys. I hoped the longer and more interesting articles would be more motivating than the shorter paragraphs we had been using. I selected materials that were written at a grade six or lower reading level so that comprehension would not be unduly difficult. I planned how to introduce coloured highlighting as an alternative method of note-taking.

The students would require guidelines to prevent the entire page from being coloured: Phrases or words, not sentences, should be underlined. A phrase could be written in the margin in lieu of a non-existent topic sentence, should that occur. A colour key would provide order: yellow for main ideas, blue for supporting details and green for definitions. The colour choices would require thoughtful and considered reading and could provide useful guidelines for later reviews.

Activating Prior Knowledge

Before introducing the coloured highlighting, I wanted to teach the students how to prepare to read an entire article. To date we had been working with words, sentences and paragraphs, but not longer articles. Learning how to anticipate an article's content helps students to activate prior knowledge and generates curiosity. Acquiring a generic means of approaching expository text would provide the students with another useful, life-long reading skill. Again, I created a series of steps for the students to follow: (1) examine the title; (2) look at the pictures and charts, and read their captions; (3) read any headings and bold print; (4) skim through the first and last paragraphs of the article; (5) think about what you already know about this topic. I explained the advantages of using this system. The article would be easier to understand and the recall of the information read would be superior. Again, I modeled the process and the group practiced it. Before reading each new article, we reviewed the procedure.

Coloured Markers in Use

The students were enthralled with the coloured makers when I introduced them. They doodled with them, re-arranged them, stacked them and generally played with them. Jeff, in particular, enjoyed switching the caps and bodies of the markers and then stacking them end-to-end. He repeated this behaviour each class in which we worked with markers.

Actually marking an article was very difficult for most of the adolescents, including Jeff. Besides having to select topic information and supporting details, they had to refer to the colour key. Jeff initially confused the yellow and blue

markers. Without staff support, I doubt that he would have even attempted the task. Evan with staff support, he quit working half way through three short pages. When another student had completed his work and was using a nearby computer, Jeff began watching the computer and refused to respond to staff encouragement. He was most reluctant to complete his behaviour rubric at the end of class.

The next time we met, Jeff arrived late and refused to remove his cap. He took the cushioned computer chair away from the computer and refused to return it. A class rule was that computer chairs were to remain with the computers. (Combining mobile chairs, carpets, a crowded classroom and teenage boys with limited boundary awareness helps to generate such a rule.) When I physically removed the chair, Jeff remained crouched by his desk in a semi-erect position. Eventually, his legs tired and he straightened. He stood by his desk for the remainder of the class, refusing to use his chair. His tics were quite marked. He was largely mute, but did interject raspberry noises, a few single word responses and some grunts while the reading clinician tried to work with him. With much assistance from her, he completed about half of another article. He could not bring himself to complete his self-evaluation, stalling half way through it. At the end of class, however, he became more animated as he presented his beaded Pokemon figures to the clinician and explained how he sold them. He was quite delighted to sell her one.

Prior to our next class, I removed the computer chairs from the classroom. I hoped that with further practice and support Jeff and the other students would begin to find the concepts easier; so, we continued with the coloured highlighting. Jeff arrived late. He informed me that he had not "forgotten" to remove his cap; he wanted to keep it on. In other words, he wanted me to know that wearing his cap was a deliberate act of defiance. He spent much time playing with the markers and discussing his Pokemon sales. On the plus side, he was becoming more verbal, even if he was off-topic. Despite his reluctance, with prompting from the reading clinician and myself, he was able to complete the previous day's article and part of that day's assignment. I was able to praise him for completing a most difficult task.

We continued with coloured highlighting for several more classes. Unfortunately, for the entire group, frustration grew faster than their skill development. In addition, behaviour was deteriorating for all of them, not just Jeff. These students acted out their frustrations. Changes were necessary.

Bringing Closure to the Highlighting Activity

To provide closure to this task and to give me more feedback, I gave the boys a highlighting test. Part of the test required single word and short phrase recall of the rules and guidelines I had been helping the students to master; the other part of the test required the boys to highlight a short article. Three of the students, including Jeff, performed fairly well on the first part of the test. However, only one student showed significant skill development with respect to highlighting. Without assistance, Jeff was lost when asked to highlight the main

ideas in the article. He identified only two main ideas, one definition and a few details in the first half of the article. Then he discontinued highlighting. Even on the first part of the test, he answered some very basic questions incorrectly (e.g. Does every paragraph have a main idea written in the paragraph?) Fortunately, I had weighted the first part of the test more heavily than the highlighting part so that the students would more likely pass the test. Self images did not need to be further undermined by more failure. Jeff earned 14 out of a possible 25 marks. He also printed answers for most of the questions, displaying increased written responses.

Traditional Outlining

Phase One

The next note-taking strategy would need to be more concrete, more obvious, as well as, markedly different from coloured highlighting. I chose traditional outlining of textbook chapters. I began this unit by teaching Roman numerals, a concept completely different from the previous unit. I asked the students if they had seen such numbers on old downtown buildings. None of the students were familiar with this numbering system; although some seemed vaguely aware of it. I emphasized the novelty and mystery factors. The students were quite interested and responded with enthusiasm to figuring out how to translate numbers back and forth from Arabic to Roman systems. However, in short order, they questioned how useful this numbering system would be. What a fine lead to introduce the structure of traditional outlines!

I showed the group a sample outline and explained that outlines were often used to organize pieces of writing. Learning the structure of outlines would allow them to analyze other people's writing and they could also use outlines to plan their own writing.

I asked the students to examine an outline and to try to identify any patterns or formulas for their structure. Responses were limited (e.g. "There's numbers and letters.") After additional probing, I supplied the boys with the structure of an outline. Initially, I focused on the sequence of number, letter, number, letter, and number. Then I pointed out the style sequence, from most prominent to least prominent: Roman numeral (upper case), letter (upper case), Arabic number (neither upper nor lower case), letter (lower case) and Roman numeral (lower case). I did not discuss indenting until much later; although I indented appropriately as I created examples.

Next class, I gave each student several different textbooks and asked them to identify parts that were similar. I explained that most authors followed similar patterns in writing textbooks. If the students could unlock the pattern, they would essentially be able to analyze any textbook. The boys were able to identify tables of content, indices and introductions.

Then I asked the students to focus on individual chapters. How were chapters from different books similar? They were able to identify graphics, such as pictures, charts, diagrams and maps, introductions, headings and end of chapter questions.

Then I asked the students to focus on the headings. Did they stay the same throughout a chapter? If not, how did they change? Why did they change? The students were able to note changes such as size and colour, but did not identify any patterns influencing the styles of headings. We listed the various means used to make headings appear different: size, colour, font, underlining, boxes, white spaces around the headings, upper and lower case formats and indenting. I asked the students to re-examine the headings and consider incorporating them into an outline. Which headings were most important? As a group they were unable to incorporate the headings into an outline format.

The first textbook we tackled together was *Gateway to Canada* (Sauve, & Sauve, 1997). This text was fairly small, soft-covered and attractive with an abundance of pictures and good use of colour. The topic, Canada, was one that all of the students should already have studied. Most importantly, the headings were clearly differentiated, with two levels of importance per chapter. Before beginning to analyze the headings, I introduced any vocabulary that might be unfamiliar. Then we reviewed how to prepare to read new expository material: (1) examine the title; (2) look at the pictures and charts, and read their captions; (3) read any headings and bold print; (4) skim through the first and last paragraphs of the article; (5) think about what you already know about this topic. While we were not going to be reading the bulk of these chapters, I did want to reinforce the preparatory stages of reading a text. Also, familiarity with the contents of a chapter could help with analyzing the hierarchy of the headings.

With prompting and nudging, the students were able to identify the boxed, all capital, large sized, and brown words as the main headings. The secondary headings were lower case, bold, smaller and teal. For chapter one, I provided the students with partially completed outlines. I had inserted in the outlines the main headings and had arranged the numbers with blank spaces for the outstanding sub-headings. All of the students were able to locate the sub-headings from the text and insert them into the outline.

Since practice and repetition aid recall, at the beginning of the next class we reviewed how headings and sub-headings could vary and how to prepare to read a chapter. I provided the students with the skeleton of an outline for chapter two—only the letters and numbers, no words. With minimal assistance, they were able to complete the outline. When they were finished, I asked them to review the outline and think of at least one good question that a teacher might ask a class to answer after reading this chapter.

Jeff's work can be seen in Appendix K. He worked quickly and confidently. He was able to complete the outline with no difficulty. For his question, he copied a picture of the parliament buildings from the text, listed eleven terms and instructed a mythical student to label the picture. This was the first free form drawing that Jeff had done in class. Best yet, it was spontaneous! His list of terms was appropriate given the chapter contents. Unfortunately, the directions were impossible. The terms and the drawing simply did not match; however, the question did reflect knowledge of typical teacher questions.

In succeeding classes, we practiced this procedure using other history, geography and science textbooks. As a group, we analyzed the differences between the various headings and sub-headings before I asked the students to complete outlines. I hoped to generalize their knowledge regarding the ability to differentiate between levels of headings and sub-headings. After working with the skeleton outlines of numbers and letters (no words), I modeled the creation of an outline without those props. Then with assistance from staff, the students began to use the headings and sub-headings to create their own chapter outlines. Most of the students were still unsure when asked to differentiate between the different levels of headings.

Phase Two

Next, I photocopied a chapter and removed the headings and sub-headings from the text. I copied the headings onto another piece of paper and cut each heading and sub-heading into a separate strip of paper. They no longer had colour as a cue; however, font, size and style were still present to assist them in this process. After the students had pre-viewed the new vocabulary and prepared to read the chapter, I asked them to figure out where the headings belonged and to glue the headings into their appropriate spaces. I suggested skimming the text to assist with the process. I explained the term "skimming" and why it was appropriate for the task. (Many students are not aware that reading rates could vary with the purpose of the task; Vacca, & Vacca, 1999)

At a basic level, I was attempting to provide experiences in both analyzing and synthesizing outlines. In one approach, they needed to select the

headings from the text to create an outline, and in the other approach, they needed to build the headings into the text.

For three of the four students, including Jeff, practice of these two processes seemed to keep them sufficiently engaged to maintain their interest. At the same time, these tasks were not so challenging as to raise frustration levels excessively. For the fourth student, who was struggling for numerous reasons, I designed an individual program that he followed with assistance from a teaching assistant.

Once the three students were comfortable with these tasks, I decided to remove some supports. I typed headings and subheadings from various textbook chapters, trying to maintain each chapter's size, font and style differences as much as possible. (Initially I added Roman numerals, capital letters and Arabic numbers. Later, I removed those supports as well.) I again cut these phrases into separate strips of paper and sorted each chapter's headings into an envelope.

I introduced the next outlining task as a puzzle. All of the strips within an envelope belonged together in one chapter. Their first task was to sort the strips into levels of importance. In other words, they needed to analyze the similarities and differences between the headings and then rank the headings based on common characteristics. The next step required them to "guesstimate" how the different levels of headings could be integrated into an outline for a chapter they had never seen. I explained that this was a difficult task and that sometimes the headings were sufficiently vague so as to make the task almost impossible.

However, I expected them to make logical guesses. After they had created their outlines, I gave them the original textbooks to compare to their outlines. Finally, after making whatever adjustments were necessary, they completed an outline for the chapter.

I ensured that plenty of staff support was available the first day that we tackled this outlining task. Because staff had to struggle with the logic of organizing these strips and could not be certain of the right answer, the students seemed to accept that an absolutely correct outline was not necessarily possible. This was not just the teacher, but a variety of adults, modeling "best guesses". After the first class, the students generally seemed to enjoy the challenge of guessing and seeing how closely they had matched the textbook's sequence. This was quite remarkable given that these three boys had fairly limited frustration tolerance levels.

After practicing this task a couple of times, one of the three students still needed assistance to organize headings into similar levels. The other two boys, including Jeff, had no difficulty organizing the headings into hierarchies. After a few exercises, Jeff was rushing ahead to complete the outline before I had completed the instructions. He was often both the first to complete the outline and the one with the fewest errors.

Phase Three

At one point when Jeff had completed his work and the other students were catching up on missed work, I decided to teach Jeff to use the Inspiration software. This program uses a computer to create word maps/webs and

organizational charts. Phrases can be typed into boxes that can be linked together in various fashions. The boxes can be edited to change shapes and become symbols. Another feature of this program is its ability to convert word maps into traditional outlines and visa versa.

Jeff was already comfortable with computers and computer programs. He also had developed a good understanding of the outline format. I wanted to see if he could also rearrange his outline information into a semantic map. I introduced him to the program and asked him to enter the last outline he had created using a semantic map format. Jeff was able to complete this task easily and efficiently. I then showed him how to convert his new word map back into an outline. Jeff wondered why the program had inserted two sets of letters and numbers before each line in the outline. I explained that the software automatically inserted the numbering and lettering. Since he had already typed the same numbers and letters into the text boxes of the semantic map, the conversion process resulted in dual numbering. Without intention, we had discovered a means of confirming the accuracy of his numbering and lettering. Using this software also showed that Jeff understood the relationships between the various headings. He was able to link the appropriate boxes together with no difficulty whatsoever. In addition, he was able to generalize his knowledge of these inter-relationships and apply it to a new format.

Phase Four

The time had come to return to the textbooks. In preparation for an outlining test, I asked the students to practice writing outlines from a couple of

different textbooks. Staff support was to be provided only if students were absolutely stuck. Jeff and the other student who had mastered the earlier task now needed very little if any assistance to create outlines.

Earlier I had explained that outlines of textbooks could be used to study for tests. Now I added that teachers often used the central ideas presented in outlines to create test questions. This was how teachers could tell if students had understood the main ideas in the chapters. Consequently, if students knew how to create questions out of the outlines, they would likely know many of the questions on a typical teacher's test.

I believed that requiring the students to re-frame the headings into questions required them to process the information more deeply. Other strategies such as KWL (Ogle, 1986) and SQ3R (Robinson, 1946) incorporated students' generation of questions as a means of increasing comprehension.

We again reviewed the 5 W's and how. Again I modeled and the students practiced using these words to rewrite the headings into questions. I added that writing was another way to help them to remember the information for a test: writing would activate other parts of the brain and would provide additional practice. In order to help me mark their work, they needed to insert the page numbers and the answers. This process ensured engagement with the text, comprehension of the material read and gave the students extra time on task, even if much of the writing amounted to variations on copying. This was more writing than they were normally prepared to do.

Unfortunately, despite my rationale, the students were less than enthralled with the amount of writing that such a process entailed. Their behaviours were deteriorating rapidly. We completed this process twice before I sensed complete mutiny approaching.

Final Assignment

I designed a final assessment. I gave the students copies of *Perspectives on Health*, a textbook that they had not seen before, and asked them to create outlines of Chapter Two. When complete, they were to use their outlines to write ten good questions that a teacher might create to make a test. They were to provide either the answers to the questions or the page numbers where the answers could be found.

Jeff's test results can be found in Appendix L. He displayed mastery of the outlining format, both the lettering/numbering system and the indenting sequence. He had generalized his knowledge sufficiently to be able to apply it in a new context. Initially, he experienced some confusion regarding the lettering/numbering system, but he was able to correct himself. This displayed not only his knowledge of the strategy, but also his ability to self-monitor and self-regulate his output. Explicit instruction, modeling and practice had indeed resulted in metacognition.

Nine of his ten questions began with "what" or "how". Each one required factual recall from the textbook. While these were less complex than "why" questions, they did meet my criteria of increasing literal comprehension. Jeff may have deliberately omitted "why" questions, since the answers to those

questions are generally longer. His questions also might be questions written by a teacher to assess basic recall of information. In short, his work could be considered a solid first step in understanding the author's information and schema. Such understanding is necessary before students can use that schema to develop reflective, inferential or judgmental comments/opinions.

CHAPTER 7

CONCLUSION

Results: Reflections on Jeff's Progress

A comparison of Jeff's behaviours and skills since beginning to work with him to the end of the intervention revealed substantial changes. In some ways his growth far exceeded my expectations and in others I was disappointed. Self-image, literacy skill and metacognition improved, but his independent ability to identify main ideas and supporting details in his reading and writing without the support of headings or staff assistance was minimal. Even though he understood hierarchical relationships of headings, he could not pick out main ideas when they were implicit and had to be inferred. In other words, when given informational text that did not use headings, he was unable to independently identify topic sentences or main ideas.

Self-Image

Jeff's self confidence regarding academic skills and peer relations grew perceptibly. He displayed stronger academic abilities than a number of the other group members. As he became more aware of his relative strengths, he began to work more effectively, starting tasks promptly, beginning to work on exercises at home and beginning to share his work. While he did not volunteer to share written work at the end of this study, he no longer physically hid or destroyed his work. He was primarily mute at the beginning of this study and most vocalizations were tics. Near the end of the study, he was willing to talk, even to strangers. For example, when my advisor was visiting, Jeff was able to share

information with her and participate in class discussion. He did still display some anxiety near the end of that particular class, refusing to clear away his supplies. However, in general his anxiety in a classroom setting had decreased. His tics diminished substantially.

Jeff's social skills had also grown. Previously he spent a lot of time and energy observing the interactions of his peers. His comments indicated awareness of the social "pecking order" within this small group. For example, he was acknowledged with laughter when he made negative or sarcastic remarks regarding the weakest member of the group, but was careful never to direct such remarks to the most dominant member. He now participated in group discussions and thoroughly enjoyed playing board games and physical education games with peers. He was aware of the values within the group and the acceptability of different topics for discussion. Some days he would mimic the others' bad language and behaviours. On one occasion, I had asked Jeff to bring a sample piece of writing from a Pokemon magazine. He did so. When I shared the piece with the other students, they made a few negative comments regarding Pokemon. Jeff responded with, "She [Ms. Lehn] asked for this and handed it out; not me." His responses to the classes that focused on appropriate class behaviour and developing the rubric indicated awareness of the acceptability of his own behaviours, even though self-regulation was still not always evident.

Academic Development

Jeff had developed his literacy skills. The quantity of his writing had definitely increased. He wrote more on the computer. He was comfortable using a computer and was able to master new software quite easily. Using headings, he was also able to create hierarchical outlines for chapters in content area textbooks, generalizing this ability to the extent that he was able to apply it to a variety of published texts and to convert these outlines into semantic maps. He understood the hierarchical relationships, in particular the degrees of importance and the relationships of different types of headings. With adaptations, Jeff was able to complete much of the Senior 1 (grade 9) science course that he began part way through the year. He also completed the Senior 1 mathematics and physical education courses.

Metacognition

Jeff developed metacognitive skills during term. He was able to learn new strategies, monitor the implementation of those strategies and then make self-corrections in order to keep the new strategies in tact. He demonstrated strategy awareness both in the application of outlining skills and in his growing ability to evaluate his classroom behaviours. Self-regulation with respect to behaviour was an area that Jeff had yet to master; however he had improved the point where he could identify appropriate classroom behaviours and was able to monitor his compliance.

Other Skills

In other areas, Jeff's skill development was either slower or less obvious. For instance, I noticed no particular changes in organizational abilities beyond the ability to organize chapter information for an outline. I was unable to ascertain improvements in social problem solving. He frequently continued to wear his cap and to arrive late for class. He skipped some days of school, probably hoping to avoid difficult situations or subjects. More open-ended, unstructured tasks continued to cause Jeff difficulty. For example, one day when his work was up-to-date, I asked Jeff to create an outline of his own logic as a pre-writing task. I wanted Jeff to be able to use the outline strategy that he had mastered to organize his own information, not just another author's text. I asked Jeff to imagine a scenario regarding Pokemon or some of the other Japanese animation characters he knew well. He was unable to use this scenario to develop headings and then to write these headings into an outline format. He approached this task with much reluctance and required considerable encouragement, despite his extreme interest in the topic and his mastery of the requested format. I believe that categorizing, or organizing the scenario into topics, was likely the major impediment to success in this more open-ended assignment that involved creative writing as opposed to reading. Jeff continued to display difficulty selecting topic sentences and supporting details from paragraphs. His comprehension in this situation seemed to be linear. After discussing the contents of a paragraph that he had written, he still needed assistance to decide upon the topic of the paragraph. Finally, although Jeff had

become more comfortable writing with a computer, he continued to avoid efforts to improve his keyboarding skills. Apparently, he was satisfied with his "hunt and peck" approach.

Recommendations

Instructional Approaches

Some instructional approaches seemed to be more effective than others for Jeff. For example, he was successful in learning when the setting was structured. A set schedule and regular routines were more comfortable for Jeff. He was uncertain in spontaneous events or field trips. Advance notice of events and clear expectations of student participation increased Jeff's ability to prepare for upcoming tasks. Direct, explicit teaching was helpful. Breaking complex tasks into short, manageable components also helped. Visual approaches, supported by auditory and kinesthetic techniques, aided Jeff's comprehension. A part-to-whole approach to teaching and learning was more meaningful for Jeff than whole-to-part. Patterns, rules and formulas helped Jeff to make sense of tasks. Jeff was more likely to engage in difficult exercises when he was able to use Pokemon, his area of intense interest, as the vehicle for learning. Ignoring his handwriting and praising the content of his writing seemed to help Jeff accept the worth of his efforts. Writing was also easier when he had access to a computer; although, he was not likely use the computer if he were being singled out. Success motivated Jeff. Finding legitimate and meaningful ways for Jeff to experience success helped him stay engaged.

Focus of Instruction

Based on the progress that Jeff made during this study, I would recommend a number of skills be addressed next term. Teaching Jeff specific formulas for reading expository texts (Manitoba Education and Training, 1996, 1997, 1998; Buehl, 1995; Vacca, & Vacca, 1999) would help him to discern the text patterns and likely facilitate the selection of topics and supporting information. Formulas could include compare/contrast, problem/solution, series-of-events, proposition/support, definition/example and cause/effect.

His writing assignments could begin with the completion of graphic organizers using the above text structures. Paragraph frames could follow; however initial frames should be short. As suggested in reflecting on the success of the intervention, Jeff would likely find using these techniques to analyze published texts easier than using them to create his own texts. Thus, using these formulas as reading comprehension strategies should precede using the same formulas to write personal texts.

Jeff's outlining skills should be implemented as a note-taking strategy in his other subject areas (e.g. Canadian Studies). This would reinforce both the skill and Jeff's appreciation of the value of the skill.

Jeff may benefit from explicit instruction in types of questions. This study focused on obvious, factual information, easily found within the text. Most curriculums require that students deal with information at more complex levels as well. Teaching Jeff "Question-Answer Relationships" (QAR's; Raphael, 1982) could help him to understand and differentiate between explicit and implicit

questions. QAR models are used to teach students to assign questions to categories: Some answers can be found "right there" or in the text; other answers can be found "in your head" or on your own by using what you already know and combining it with the text information. Some teachers teach three levels of questions (Black, 2001): in the lines, between the lines and beyond the lines. The first level is factual recall, the second level requires interpretation of the text and the third level requires application to other situations.

As Jeff's weak fine motor skills cause his printing to be both laborious and somewhat difficult to read, keyboarding abilities would definitely help Jeff to communicate more effectively. Jeff may be ready to develop his keyboarding skills. Once he appreciates how much more effectively he will be able to write, he may invest more of himself in the acquisition of keyboarding. If other students are also studying keyboarding, he might be cajoled more easily into this activity. Being able to earn a relatively easy high school credit might also provide an incentive to learn.

Long-Term Planning

Long-term planning for Jeff's life after high school should begin now. The directions those plans take will influence the high school courses that he selects. In addition, resources may take time to arrange and research may be required to select an appropriate career path. Initiating long term planning does not mean that the plan is fixed; rather, the plan allows Jeff, his family, school and other involved professionals to study alternative options for the future and to make intelligent, informed choices along the way.

A booklet entitled the *Manitoba Transition Planning Process Support Guidelines for Students with Special Needs Reaching Age 16* (1999) is a package published by Manitoba's Children and Youth Secretariat to facilitate such planning. It amalgamates information from three different government departments: Education & Training, Family Services and Health. Students with special needs could conceivably require services from a combination of these departments. Even if specialized services are not required, the planning information is helpful for students who are experiencing a variety of difficulties. Planning procedures, resources and recommended timelines are provided.

This document recommends that choices be based on the student's "abilities & experiences, interests & aptitudes, type of disability, need for supports, dreams or hopes for the future" (p. 7). Based on this general recommendation, I have developed several specific suggestions.

Jeff should explore careers related to computers or to his mathematical abilities. Career exploration programs are frequently available in most high schools. Jeff should participate in such a program when he leaves this setting. At present he is unsure of his options and vague when asked about his visions of the future. He will require further social skills and communication skills training; a career requiring strong interpersonal skills would not be recommended.

He will need extra assistance in high school to complete the English language arts requirements. With sufficient skill development, he may succeed; although, he will certainly require course adaptations and resource assistance. For further information regarding "adaptations" and "modifications", see the

Province of Manitoba's *Towards Inclusion: A Handbook for Modified Course Designation, Senior 1-4*, (1995). At present, Jeff does not have the communication skills necessary to complete the province's English language arts course curriculum objectives. Despite progress, Jeff's speaking and writing abilities represent severe limitations to satisfactory performance within the language arts strands: speaking, listening, reading, writing, viewing and representing (Manitoba Education and Training, 1997). At the same time, he likely does not meet the definition of "significant cognitive impairment" that is required to be eligible for course modification. Hopefully, his abilities will develop and cognitive impairment will become a non-issue. If not, this issue will need to be resolved through collaborative planning and possible consultation with representatives from the school division and/or the Department of Education and Training.

When Jeff is ready to transition from the treatment center, he and his parents will need to select a school. They will need to consider which type of school will best serve his needs. This might be his local community school, a school that offers vocational training, or a school that has teachers with expertise in learning disabilities and/or Autism and Asperger's syndrome. The school division where he lives has high schools within each of these categories. Researching the possible schools and comparing them to the desired school characteristics discussed earlier in this study will require time and thought. As the resource/bridging teacher, I will work with Jeff's social worker and with his family to support that process. Some general transitioning information already

has been shared with Jeff's parents through a presentation arranged for the parents of our students.

Jeff needs to find a mentor or advocate, not just in school but also later, as an adult. This should be someone Jeff trusts who will assist with social problem solving and will advocate on Jeff's behalf. He or she will explain to Jeff's teachers, employers, landlords and so forth, the strengths and limitations associated with Asperger's in general, and Jeff in particular. Awareness of the issues related to Asperger's syndrome frequently results in greater tolerance for seemingly odd behaviours and in making appropriate provisions and accommodations. A mentor might be a parent, another relative, a family friend, a counselor or a social worker.

Other issues related to mental health should be incorporated into his long-term plan. Some of these include the training and development of: social and communication skills, life skills, and relaxation techniques (anxiety and stress reduction), as well as problem solving strategies and instruction to recognize and react appropriately to emotions. Attwood (2000) has suggested a more complete list of possible areas requiring assistance.

Jeff should be encouraged to continue participation in physical activities, his motor skills being rather weak (e.g. clumsiness and awkward gait), he may begin to avoid such activities. He should be encouraged to find a physical activity that can be incorporated into his life style and would help to keep him fit.

As Jeff matures, other issues such as dating will arise. Counseling regarding the intricacies of such relationships may well be advised. New

concerns such as this may be added to the long-term plan. Similarly, issues such as adapted versus modified courses may be deleted from the plan when they have been resolved.

Results: Instructional Principles

Findings from this study support a number of general instructional principles that apply to teaching students with Asperger's syndrome. Providing the student with a safe, structured environment was one of the most critical factors. Because these students do not readily grasp social interactions and lack the ability to respond to novelty, they require familiar routines. They need to understand context, purpose and expectations for any assignment. Both content and procedures need to be presented prior to a task.

Social Stories

Scripts should be developed prior to introducing a new task or a task that has previously been identified as challenging. Such scripts should prepare the student for the possible chain of events, the reactions of others, and the likely behaviours expected of the student. Such students may require considerable advance preparation, such as reading and discussing the script, and role playing a day or more in advance of a novel situation. Scripts could be based on Gray's "social stories" (Gray, 1995; Gray, Dutkiexica, Fleck, Moore, Cain, Lindrup, Broek, Gray & Gray, 1993, Gray & Gerard, 1993).

Gray developed social stories as a strategy for supporting students with Autism. She developed a formula using descriptive, perspective and directive sentences to explain in a concrete way upcoming social events that might cause

the student difficulty. The stories are taught well in advance of the relevant situation. Immediately prior to the situation, the story is rehearsed. After the situation, the student evaluates the situation and his/her response(s). Such stories prepare the student prior to an event, provide context, interpret the event and offer recommended acceptable behaviours.

Predictability and Organization

There should be no ambiguity, ambivalence or uncertainty in the mind of the student. This relates not just to social interactions, but also to schedules, procedures and physical environments. The physical environment should be consistent and organized. Students with Asperger's frequently require support to find their ways around the classroom, find necessary materials, sort notes and binders and use their lockers.

Instruction

The purpose for a task must be explicit, clearly understood and appreciated by the student. If the teacher's objectives do not seem meaningful, then the student with Asperger's will not likely cooperate. Instead, the student may display behaviours that appear to be stubborn and noncompliant.

Explicit instruction may also be required for seemingly obvious assignments. Assume nothing. Students with Asperger's frequently display uneven knowledge and achievement levels. For example, extensive vocabularies do not equate with comprehension. A student may easily have word recognition skills at a high school or university level and yet may comprehend materials at an elementary or even primary level. In Jeff's case, he

required explicit instruction in the five W's and H in order to be able to reframe headings into questions and to select detail information. Gaps in knowledge often co-exist with considerable expertise in related areas. Without assessing pre-requisite skills, students may experience frustration. Lack of social skills, such as knowing how to ask for help, exacerbate the student's frustration. Again, unacceptable behaviours may result.

Students with Asperger's require more scaffolded learning situations than the average student. Plenty of initial supports, such as manipulatives, concrete examples and explicit teaching, should be available. As the student displays growth, supports should be gradually withdrawn and responsibility should be slowly relinquished to the student. In Jeff's situation, manipulatives together with sort and predict activities were used with a variety of texts before Jeff understood the concept of outlining and was able to create outlines independently.

Understanding hierarchical structures is very difficult for students with Asperger's. Developmentally, these students may not be ready for such activities until well after other students have mastered them. When they are ready to learn these concepts, scaffolding and concrete learning situations are beneficial. Jeff was able to master the hierarchy within an outline structure, but was unable to consistently identify topic sentences and supporting details, despite considerable support and direct teaching.

Assessing prior knowledge and helping students to relate new information to what they already know is vital. As previously stated, uneven knowledge is quite common. Students with Asperger's often have difficulty understanding

exactly how new information is connected to previous knowledge. Jeff had some awareness of various numbering and lettering systems, but needed instruction and practice to understand how these systems related to each other in an outline format.

Sustained positive interactions lead to feelings of success and competence. Jeff needed many opportunities to practice outlining before he displayed expertise and enthusiasm when assigned new outlining tasks.

More time is needed to master some concepts, particularly those concepts related to areas of difficulty for students with Asperger's. Jeff needed considerable time to master outlining and will need more time yet to master the identification of main ideas and supporting details.

Finally, and possibly most importantly, teachers of students with Asperger's need to be especially reflective and use assessment to inform instruction. Try an activity, observe and think about the results, and create other activities to accomplish the same teaching outcome. Assessment and teaching should be intertwined, ongoing and mutually dependent. Teaching strategies are continuously revised as feedback and observation indicate either growth or difficulty. Selecting appropriate activities should be based on the student's strengths, limitations and learning styles and not necessarily on the instructional approach that is in vogue. Collaborative learning, abstract problem solving and open-ended, creative tasks may stimulate and support many students, but they are rarely effective for students with Asperger's. More likely, concrete tasks with visual and verbal supports, independent work, and rote, rule-bound learning will

be most effective. Only through ongoing assessment of the student's performance can teachers determine which instructional approach and learning strategies will be most beneficial.

Recommendations for Further Research

In the course of this study, I noticed several areas where further research regarding Asperger's syndrome would be appropriate. Controlled studies of the usefulness and relative merits of various social skills packages would certainly assist educators and treatment centers in developing programming. A second area where research would be beneficial is studying the strengths and limitations of various school placements. At present, parents are making best-guess choices. Options for study might include regular classrooms with support from paraprofessionals, low enrolment settings for students with social skills deficits, low enrolment settings for students with learning disabilities and specialized programs for students with Asperger's syndrome. Further research regarding effective academic teaching techniques would be useful. Research regarding the efficacy of metacognitive training would also be highly informative. Lastly, researching the development and efficacy of early identification and intervention programs would likely provide source material to support government intervention in a timely and cost effective manner. Attwood (2000) believes such programs could assist in significantly reducing the severity of the characteristics associated with Asperger's syndrome.

Summary

> Children diagnosed with Asperger syndrome...present a special challenge in the educational milieu. Typically viewed as eccentric and peculiar by classmates, their inept social skills often cause them to be made victims of scapegoating. Clumsiness and an obsessive interest in obscure subjects add to their "odd" presentation. Children with Asperger's syndrome lack understanding of human relationships and the rules of social convention; they are naive and conspicuously lacking in common sense. Their inflexibility and inability to cope with change causes these individuals to be easily stressed and emotionally vulnerable. At the same time, children with Asperger's syndrome (the majority of whom are boys) are often of average to above-average intelligence and have superior rote memories. Their single-minded pursuit of their interests can lead to great achievements later in life (Williams, 1995, p. 9).

That success in later life is most likely to occur if the child has been surrounded by caring, sensitive adults, aware of the strengths and limitations of the child and the adaptations that the child requires in order to learn most effectively. To support those adults and particularly the teachers, I have provided background information on Asperger's syndrome and have narrated a qualitative study that may develop not only further understanding of one particular child who has Asperger's syndrome, but also provide an outline for an instructional intervention.

The background information has included a brief history of the disorder, definitions of terms such as Asperger's, PDD and PDD-NOS, as well as, descriptors of the characteristics. These characteristics focus on social interaction, social communication and social imagination and flexibility of thought, the areas causing the greatest difficulties for most children with Asperger's. Details regarding other associated characteristics, medication, possible causes,

frequency, onset, diagnosis, assessment and treatment have been included in order to provide context for the study. Current theories of Theory of Mind, Central Coherence Deficit Theory and Executive Function Deficit are not only interesting, but act as catalysts to assist in understanding the unusual thinking and behaviours of these students.

As a basis for instruction, I researched important considerations in adolescent literacy development. As a result of that research, I planned and implemented an instructional intervention that combined both reading and writing within the context of efferent or expository materials, incorporated motivational techniques, developed schema for the text and made information linkages by activating background knowledge, at the same time as I made the purpose of the activity explicit and stressed the use of metacognitive strategies. I assessed my students' strengths, limitations, behaviours, contexts and needs and used these to develop instruction and the choice of appropriate materials. Then I selected note-taking as a theme for instruction.

I carefully designed my study. I selected a student who clearly displayed the characteristics associated with Asperger's syndrome. I received permission from the student's father to document his learning. In order to protect this student's privacy, I selected a pseudonym—Jeff. I established a protocol for collecting data. Then I consulted with other professionals and used triangulation procedures in order to ensure reliability and validity in a narrative format. I researched techniques that would assist in my interpretation of events. Finally, I began my intervention procedures.

The narrative case study that followed, regarding the experiences and learning of one student diagnosed with Asperger's syndrome within a milieu of three other students, provided a window of opportunity that others might use to gain insight into their own classroom practices. The narrative also incorporated my analysis and problem solving in an attempt to provide effective literacy instruction. Collecting background information, evaluating that information, predicting an effective remedial strategy, implementing that strategy, evaluating that strategy's merits, modifying instruction or selecting alternative strategies and re-evaluating the results of that phase of instruction is a pattern familiar to most teachers. Through this cycle of diagnostic teaching I hoped to support literacy development with a small group of four adolescent males, including the student I chose as the star in this study.

My documentation of the reactions of that one student with Asperger's syndrome was designed to help educators better understand the thinking patterns, abilities and needs of students with this disorder. My goal was to produce an enlightening, qualitative study. With understanding and appreciation of this disorder, teachers may prepare more effective instructional programs and establish more collaborative relationships with such students and their parents.

> Teachers can play a vital role in helping children with Asperger's syndrome learn to negotiate the world around them. Because children with Asperger's syndrome are frequently unable to express their fears and anxieties, it is up to significant adults to make it worthwhile for them to leave their safe inner fantasy lives for the uncertainties of the external world. Professionals who work with these youngsters in schools must provide the external structure, organization, and stability that they lack. Using creative teaching strategies with individuals suffering from Asperger syndrome is critical, not only to facilitate academic success, but also to help

> them feel less alienated from other human beings and less overwhelmed by the ordinary demands of everyday life (Williams, 1995, p. 16).

Epilogue

In September 2001, Jeff became a member of the treatment center's Youth Council. He volunteered to be the secretary. With staff assistance, he was able to take minutes, recording the date and time, members present, main points of discussion and information relating to the next meeting. Two things stand out. First, Jeff had developed sufficient self-confidence to volunteer to write in public and share his work, and second, his writing ability had improved remarkably, a far cry from his state a year ago when he was referred to resource for help with writing. Also, he viewed this task as purposeful, an important factor in developing motivation for tackling a difficult task.

Appendix A

Fictional Case Study

The following is a description of a student similar to one many teachers have experienced. This case study makes the medical diagnosis more familiar:

> You stand at the front of your classroom and watch the students pour through the door. John stumbles a little as he follows the others. His movements are awkward and rather gauche. His clothes somehow seem different from the others. He's carrying too much: several binders with crumpled papers escaping from the load and books dealing with his all consuming interest--volcanoes. A student near John unintentionally turns towards him and you hear John's loud, flat, pedantic voice begin to describe volcanoes again. The other student makes a comment under his breath and walks away. A third student snickers and you hear, "Volcano boy is at it again. Why don't you go jump in one?" John's face turns red and his voice gets even louder, "That's not nice. You shouldn't talk to me that way." You intercede and spend considerable time trying to calm John down.
>
> Later, in the staff room, you think about John. He's awkward and doesn't know how to get along with the other kids. In fact, he's often a victim of the class bully. All that he seems to be able to talk about is his one area of interest. He doesn't 'get things'. He's so concerned about rules and fairness, but doesn't seem to realize when he's monopolizing your time or another student's who is too polite to brush him off. He gets so angry and stubborn when you ask him to do something he doesn't want to do. He often says he's sick to try to get out of P.E. class. He doesn't understand metaphors and even many puns; although, his language skills seem pretty good. Creative writing is impossible. He's quite disorganized. John has a hard time getting started with his work, and later, getting ready to leave class. His handwriting is very poor, when you finally coerce him into doing a little writing. If he can't see something, he doesn't seem to understand it. Yet, the school psychologist said that his overall I.Q. was average. However, there was a spread between his language and performance scores, his verbal skills being significantly stronger. He doesn't seem to pay attention in class very well and doesn't hand in very much work. When you talk to John's parents, they seem stressed and frustrated. On the plus side, John attends school quite regularly and enjoys reading non-fiction books. He's an expert on volcanoes. He's also developing considerable interest in using computers. He is very honest; although, sometimes that honesty is over zealous

and gets him in trouble with his peers. He's said that he really wants to have friends. You've also noticed that John handles unusual activities more easily when he's given advance notice. So, how do you help John to become more successful in school?

John is typical of a youth with Asperger's syndrome.

Appendix B

Diagnostic Criteria for Asperger's Disorder from the DSM-IV (1994)

A. Qualitative impairment in social interaction, as manifested by at least two of the following:

(1) marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction
(2) failure to develop peer relationships appropriate to developmental level
(3) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)
(4) lack of social or emotional reciprocity

B. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

(1) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
(2) apparently inflexible adherence to specific, nonfunctional routines or rituals
(3) stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting, or complex whole-body movements)
(4) persistent preoccupation with parts of objects

C. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

D. There is no clinically significant general delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years).

E. There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood.

F. Criteria are not met for another specific Pervasive Developmental Disorder or Schizophrenia.

Source: American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders. (4th ed.). Washington, DC: Author.

Appendix C

Diagnostic Criteria of Asperger's Syndrome from ICD-10 (World Health Organisation, 1993)

A. There is no clinically significant general delay in spoken or receptive language or cognitive development. Diagnosis requires that single words should have developed by 2 years of age or earlier and that communicative phrases be used by 3 yeas of age or earlier. Self-help skills, adaptive behaviour, and curiosity about the environment during the first 3 yeas should be at a level consistent with normal intellectual development. However, motor milestones may be somewhat delayed and motor clumsiness is usual (although not a necessary diagnostic feature). Isolated special skills, often related to abnormal preoccupations, are common, but are not required for diagnosis.

B. Qualitative abnormalities in reciprocal social interaction are manifest in at least two of the following areas.

   (a) failure adequately to use eye-to-eye gaze, facial expression, body posture, and gesture to regulate social interaction:
   (b) failure to develop (in a manner appropriate to mental age, and despite ample opportunities) peer relationships that involve a mutual sharing of interests, activities and emotions;
   (c) lack of socio-emotional reciprocity as shown by an impairment or deviant response to other people's emotions: or lack of modulation of behaviour according to social con- text: or a weak integration of social, emotional and communicative behaviours;
   (d) lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. a lack of showing, bringing, or pointing out to other people objects of interest to the individual).

C. The individual exhibits an unusually intense, circumscribed interest or restricted, repetitive and stereotyped patterns of behaviour, interests, and activities manifest in at least one of the following areas.

   (a) an encompassing preoccupation with stereotyped and restricted patterns of interest that are abnormal in content or focus: or one or more interests that are abnormal in their intensity and circumscribed nature though not in the content or focus;
   (b) apparently compulsive adherence to specific, non-functional routines or rituals;

(c) stereotyped and repetitive motor mannerisms that involve either hand/finger flapping or twisting, or complex whole body movements;
(d) preoccupations with part-objects or non-functional elements of play materials (such as their colour, the feel of their surface, or the noise/vibration that they generate);

However it would be less usual for these to include either motor mannerisms or preoccupations with part-objects or non-functional elements of play materials.

D. The disorder is not attributable to the other varieties of pervasive developmental disorder: simple schizophrenia, schizo-typal disorder, obsessive-compulsive disorder, anankastic personality disorder, reactive and disinhibited attachment disorders of childhood.

Cited in Attwood, T. (1998). Asperger's syndrome: A guide for parents and professionals. London, U.K.: Jessica Kingsley.

Appendix D

Diagnostic Criteria for Asperger's Syndrome From Gillberg and Gillberg (1989)

1. **Social impairment** (extreme egocentricity)
   (at least in two of the following):
   - (a) Inability to interact with peers
   - (b) Lack of desire to interact with peers
   - (c) Lack of appreciation of social cues
   - (d) Socially and emotionally inappropriate behaviour

2. **Narrow interest**
   (at least one of the following):
   - (a) Exclusion of other activities
   - (b) Repetitive adherence
   - (c) More rote than meaning

3. **Repetitive routines**
   (at least one of the following):
   - (a) On self, in aspects of life
   - (b) On others

4. **Speech and language peculiarities**
   (at least three of the following):
   - (a) Delayed development
   - (b) Superficially perfect expressive language
   - (c) Formal pedantic language
   - (d) Odd prosody, peculiar voice characteristics
   - (e) Impairment of comprehension including misinterpretations of literal/implied meanings

5. **Non-verbal communication problems**
   (at least one of the following):
   - (a) Limited use of gestures
   - (b) Clumsy/gauche body language
   - (c) Limited facial expression
   - (d) Inappropriate expression
   - (e) Peculiar stiff gaze

4. **Motor clumsiness**
   Poor performance on neuro-developmental examination

Cited in Attwood, T. (1998). Asperger's syndrome: A guide for parents and professionals. London, U.K.: Jessica Kingsley.

Appendix E

Diagnostic Criteria for Asperger's Syndrome From Szatmari, Bremner and Nagy (1989)

1. **Solitary**
   (At least two of the following):
   - No close friends
   - Avoids others
   - No interest in making friends
   - A loner

2. **Impaired social interaction**
   (At least one of the following):
   - Approaches others only to have own needs met
   - A clumsy social approach
   - One-sided responses to peers
   - Difficulty sensing feelings of others
   - Detached from feelings of others

3. **Impaired Nonverbal Communication**
   (At least one of the following):
   - Limited facial expression
   - Unable to read emotion from facial expression of child
   - Unable to give message with the eyes
   - Does not look at others
   - Does not use hands to express oneself
   - Gestures are large and clumsy
   - Comes too close to others

4. **Odd speech**
   (At least two of the following):
   - Abnormalities in inflection
   - Talks too much
   - Talks too little
   - Lack of cohesion to conversation
   - Idiosyncratic use of words
   - Repetitive patterns of speech

5. **Does not meet DSM-III-R criteria for Autistic Disorder**

Cited in Attwood, T. (1998). Asperger's syndrome: A guide for parents and professionals. London, U.K.: Jessica Kingsley.

Appendix F

Name: _____

Two Column Notes		
Class:	Topic:	Date:
Main Ideas	**Details or Support**	

Source: Manitoba Education and Training. (1996). Success for all learners: A handbook on differentiating instruction (p. 6.83). Winnipeg, MB: Author.

Appendix G

GRAPHIC ORGANIZER:

COMPARE AND CONTRAST

Date:_____ **Name:**_____

_____ **vs.** _____
(Topic 1) (Topic 2)

Similarities

_____
_____
_____
_____
_____
_____
_____
_____
_____

Differences

_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

Appendix H

A Compare and Contrast Paragraph Frame

Date:_____ **Name:**_____

_____
(Title)

_____and_____
_____have many similarities, as well as, many differences. This report will first point out some of the similarities, and then some of the differences.

The main similarities are as follows: First, they both _____
_____
_____.
Secondly, _____
_____
_____. Thirdly,
_____
_____.
Next, _____
_____.
Finally, _____
_____.

There are also important differences between _____
_____and _____.
One difference is _____
_____
_____. Another difference is _____
_____
_____. A third
difference includes _____
_____

_____. In addition, they are dissimilar in that _____

_____

_____. Lastly, there is a difference in

_____

_____

_____.

In conclusion, _____and _____differ in some ways and are the same in others. However, the _____(similarities/differences) seem to outweigh the _____(similarities/differences). Thus, _____and _____ _____are more _____(alike/different) than they are _____(alike/different).

Appendix I

Self-Regulated Strategy Development Model for Teaching Strategies

1. Describe the target comprehension strategy. Explicitly describe the strategy steps, and discuss *why* the strategy should be used, *what* it accomplishes, and *when and where* the strategy may be used.

2. Activate background knowledge. Review information students may have learned previously that is necessary for learning the target strategy.

3. Review current performance level. Provide feedback to students regarding their current level of functioning and reiterate potential benefits of the strategy. Goals for and commitment by the students should be reached collaboratively.

4. Model strategy and self-instructions. Demonstrate how to use the strategy in a meaningful context, and use relevant self-regulatory behaviours by thinking out-loud. Self-statements include ideas such as "What should I do first?" "I am using this strategy so that I can understand what I am reading better... "; or "I need to take my time," which show students the purpose of the procedures and how to manage their performance.

5. Provide Collaborative practice. Provide *several* opportunities for student practice using the strategy and self-statements as a whole class, in small groups, or in pairs. Monitor students' progress in following the strategy steps. Facilitate students' success in using the strategies by prompting them to complete steps if they are omitted or by providing assistance in completing strategy steps accurately. It may be necessary to re-explain or model some of the more difficult aspects of the strategies, based on student need.

6. Provide for Independent practice and mastery. After determining that the students know and understand the steps of the strategy, each student practices using the target strategy and self- statements without help. Continue to give guidance, reinforcement, and feedback. Gradually fade assistance until each student is capable of using the strategy without any help.

7. Invite Generalization. Discuss with students throughout the week whenever situations arise where it is appropriate for students to apply the strategies. In addition, during collaborative and independent practice sessions, provide students with different types of materials (e.g., lookbacks are useful with narratives, expository text such as science book chapters, and learning rules to play a game) so that students learn to use the strategies flexibly.

Source: Swanson, P.N. & De La Paz. Teaching effective comprehension strategies to students with learning and reading disabilities. Manitoba association of resource teachers journal, 18(2), 16-23.

Appendix J

Name:_____

Daily Tracking Form

Date:_____

To be completed in the last 5 minutes of class.

C = Consistently U = Usually S = Sometimes R = Rarely

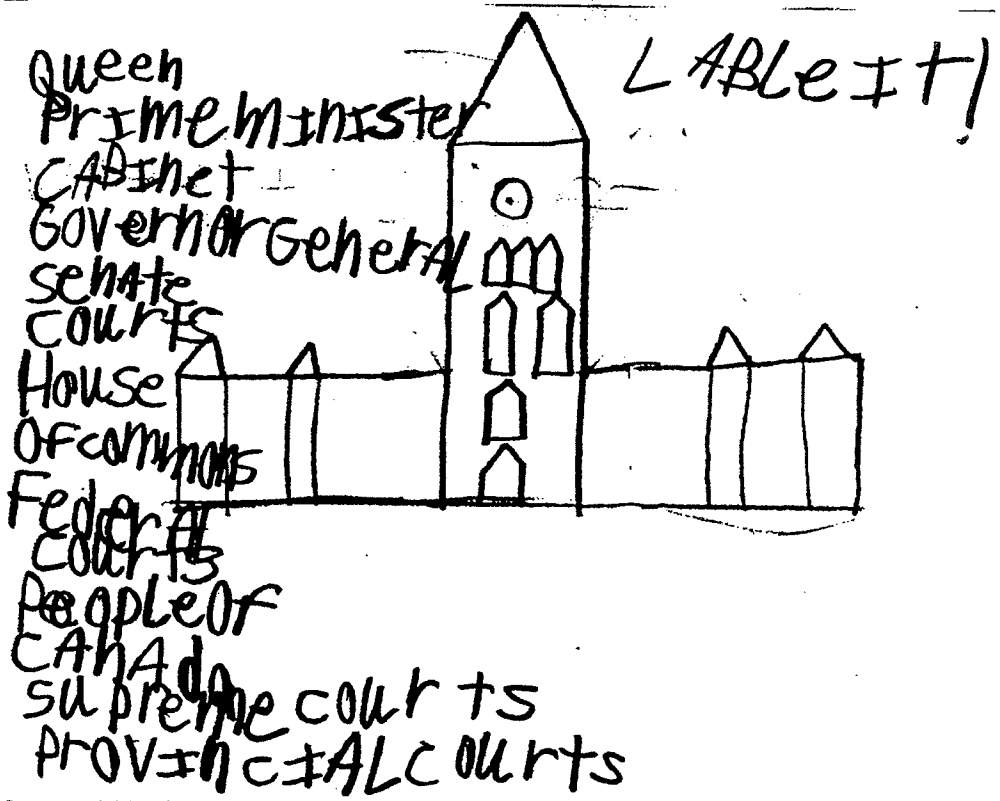
Class	Be There/ Be Ready *On time *Jacket/hats in locker *Bring supplies *Homework ready *Use washroom before class	Be Responsible *Homework done *Do best work *Stay on task *Use an agenda	Follow Teacher Directions *Listen to the teacher *Pay attention *Sit straight	Observe Personal Space *Keep hands, feet and possessions to self *Stay in assigned space	Be Respectful *Use "please", "thank you" and "excuse me" *No talking out of turn *No inappropriate comments or swearing *No put-downs *No food or drink in the classroom	Staff Initials
1	C U S R	C U S R	C U S R	C U S R	C U S R	
2	C U S R	C U S R	C U S R	C U S R	C U S R	
3	C U S R	C U S R	C U S R	C U S R	C U S R	
4	C U S R	C U S R	C U S R	C U S R	C U S R	
5	C U S R	C U S R	C U S R	C U S R	C U S R	

Appendix K

Gateway to Canada: Chapter Two Outline and Question

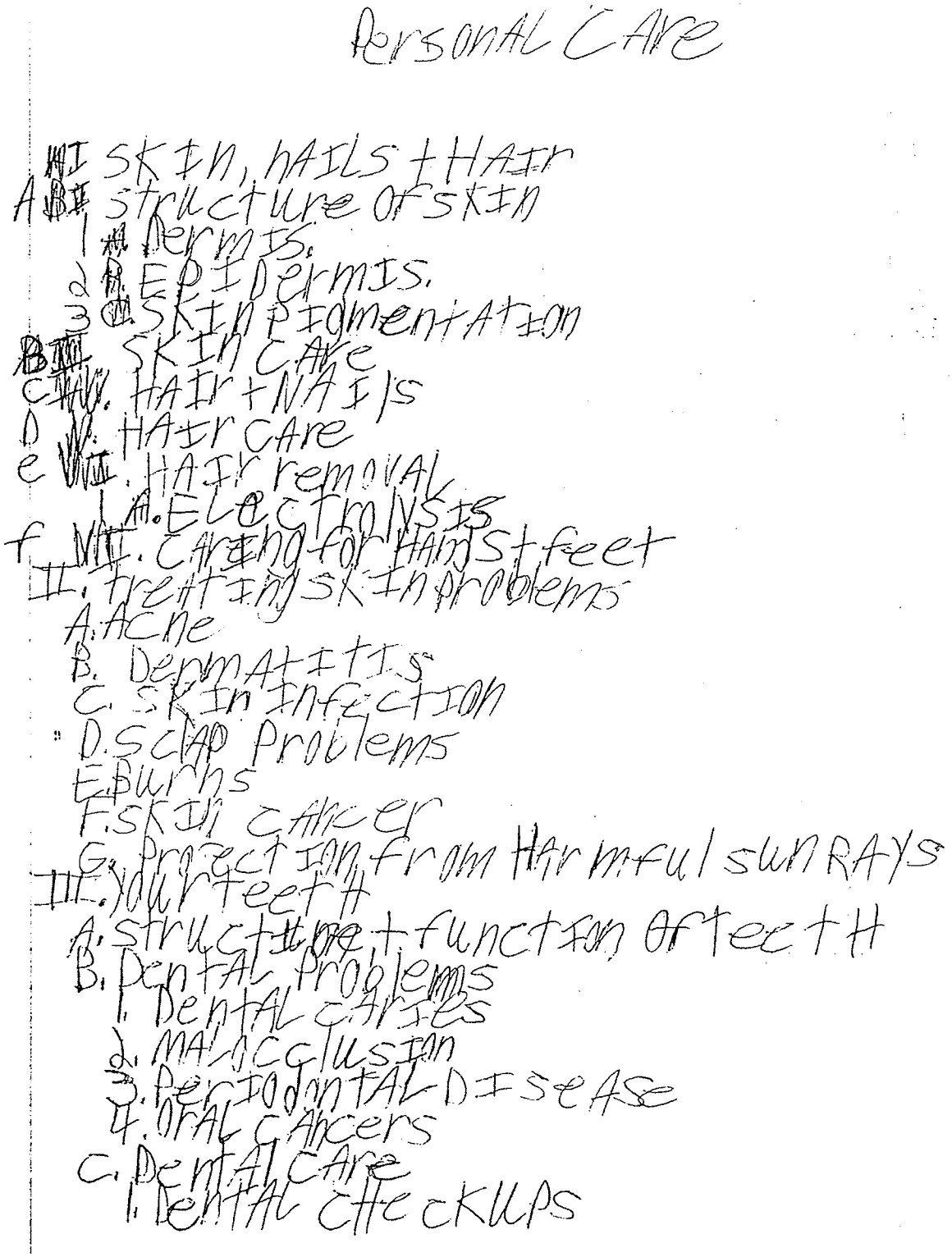
Gateway to Canada
Government and Economy

Government and Economy
I. Introduction
A. CANADA in the 20th century
II. Government in CANADA
A. 3 levels of Government
B. POLITICAL PARTIES
III. elections in CANADA
IV. elements of Government
V. CANADIAN economy
VI. CANADIANS AT WORK



Source: Sauve, V.L. & Sauve, M. (1997). Gateway to Canada. Don Mills, ON: Oxford University Press.

Appendix L—Outline Test



Text Source: Getchell, L., Pippin G. & Varnes, J. (1992). Perspectives on health. Toronto, ON: D.C. Heath and Company.

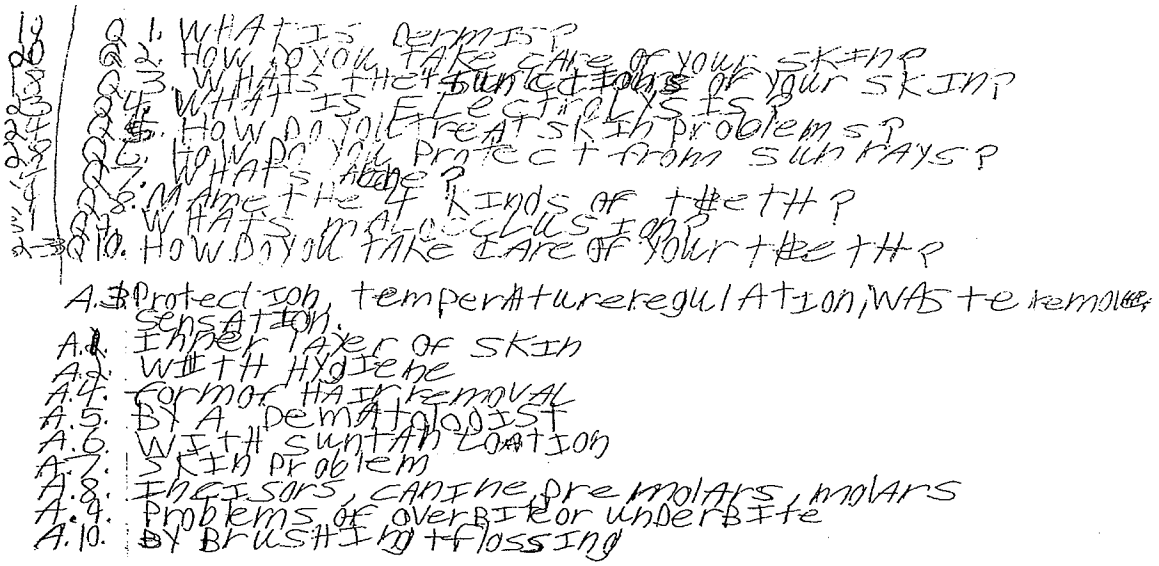
Appendix L (continued)

Jeff's original work used the entire page from edge to edge. Copying and reduction have adversely affected legibility.

Q1 through Q10 are the ten questions that Jeff developed after outlining Chapter Two of *Perspectives on Health*.

To the left of these questions are the page numbers where the answers can be found.

A1 through A10 are Jeff's answers to his questions.



Appendix M

Web Sites

The following internet web sites may provide additional useful information. As web sites change regularly, this should not be considered a definitive or current list.

Asperger's Association of New England. . . . . www.aane.org

Asperger Syndrome Coalition of the United States, Inc.
www.asperger.org

Asperger Syndrome Education Network, Inc. (ASPEN)
www.aspennj.org

Asperger's Syndrome Support Network (Australia)
www.vicnet.net.au/vicnet/community/asperger

Autism Society of America. . . . . www.autism-society.org

Centre for the Study of Autism. . . . . www.autism.org

Division TEACCH (Treatment and Education of Autism and related Communication handicapped Children, University of North Carolina at Chapel Hill)
www.unc.edu/depts/teacch

Geneva Centre for Autism. . . . . www.autism.net

Learning Disabilities Association of America. . . www.ldanatl.org

National Autistic Society (United Kingdom). . . . www.oneworld.org/autism_uk

Online Asperger Syndrome Information and Support (OASIS)
www.udel.edu/bkirby/asperger

Tony Attwood's web site. . . . . www.tonyattwood.com

Web site prepared by individuals with autism/Asperger's syndrome
http://amug.org/na203/index.html

Yale Child Study Center. . . . . www.autism.fm

References

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