Relationship between Attention Deficit/Hyperactivity Disorder and Substance Use Disorders among Adult Basic Education Students

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Abstract

This study was designed to investigate the incidence of, and the relationship between Attention Deficit/Hyperactivity Disorder (ADHD) and Substance Use Disorders among Adult Basic Education students at Wascana Campus of the Saskatchewan Institute of Applied Science and Technology (SIAST). Participants were recruited from the Intake/Assessment unit of the Adult Basic Education program. The screening tools for attention included the Wender Utah Rating Scale (WURS), a self-report rating scale that assesses childhood behaviour for ADHD, and an objective computer-generated vigilance test called the Connors' Continuous Performance Test (CPT). The screening for the probability of substance use disorders was measured by the Substance Abuse Subtle Screening Inventory (SASSI-3). Two hundred and sixty-seven students agreed to participate in this study from 1996 to 1998. The students had an average age of 29 years. Fifty-six percent of the students were female and 58 % self-identified under the Education Equity Program with 42 % representing Aboriginal people. Forty percent of the Adult Basic Education students in this study currently had attention problems, and 51 % had a high probability of substance use disorders. There was a high rate (31 to 49 % on the WURS) of apparent childhood ADHD which compares to 3-10 % of the childhood population. The combined WURS and CPT test results are suggestive of a 14 % rate (double general population estimates) of persistent ADHD symptoms into adulthood for this population. There was a significant relationship between the childhood ADHD behaviours and the later probability of substance use disorders (WURS and SASSI-3). Results suggest that Adult Basic Education personnel need to recognize that ADHD and Substance Use Disorders are realities in Adult Basic Education environments.

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Chapter 1: Introduction

Preamble

Life is a journey of relationships. We have a relationship with ourselves, our family, our friends, our community, our culture and our Creator. Everyone has a story to tell about these relationships and their experiences. As an instructor in Adult Basic Education (ABE) for over twenty years, I have been privileged to hear and learn from many people's stories. Generally these adults, who are returning to school to get their grade ten, have lived through incredible hardship. I have great admiration for my students' courage and determination to survive. I realize that telling our stories is a way of validating our experience and beginning the process of change and healing.

Listening to the students' stories has shaped the way that I work with them. I believe that education is a transformative process and my role is to work with students to facilitate this transformation. My students have returned to school because they want their lives to be different. A majority of Adult Basic Education students are under 30 years of age, female, Aboriginal, and have been on welfare (SIAST, 1992; SIAST, 1994). They want the academic qualifications that will open the door to training and future employment. Many are single parents who want a better life for themselves and their children. Above all they seek empowerment to influence their lives. Together we try to discover what it will take to achieve the difference. All of these students left school when they were younger for a variety of reasons. Our task, as students reenter school through the Intake/Assessment program, is to explore their strengths and identify any learning difficulties such as Attention Deficit/Hyperactivity Disorder (ADHD) or barriers such as substance abuse or dependence that may interfere with learning.

Drugs and alcohol permeate students' stories. Often they grew up in homes where

substance abuse wreaked havoc and pain and this has continued into their adult lives. Discovering that there is a connection between substance use and Attention Deficit/Hyperactivity Disorder (Biederman, Wilens, Mick, Farone, Weber, Curtis, Thornell, Pfister, Jetton, & Soriano, 1997; Hallowell & Ratey, 1995; Mannuzza, Klein, Bessler, Malloy, LaPadula, 1993; Weiss, 1992; Wilens, Biederman, Spencer, & Frances, 1994), has helped me to understand the pumping legs, the restlessness, and the trouble with attention that I observe in class. An inability to focus makes it difficult to learn as does ongoing substance abuse or dependence. Getting help in these areas could have a tremendous effect on student success. It is my hope that this thesis will help to deepen our understanding of the relationship between substance use and ADHD and to inform our practice in Adult Basic Education.

To understand and define the educational context for this study, it will be useful to identify world trends and how they are affecting the adult population of this study and the delivery of educational programs.

Trends

The globalization of the economy, the advent of the information age, and technological change have thrust Canadian society onto a new stage. There are new lines to learn and new parts to play. The changing work place requires new ways of working and new skills. Our once resource-based economy has shifted to a service-based economy. The population is aging and the demographics are changing. These trends, according to the Organization for Economic Co-operation and Development (OECD), of which Canada is a member, require a new focus for education and training. The OCED sees education and training as keys to generating economic growth, to reducing social

inequality and to securing democracy (OECD, 1996).

Globalization

The Organization for Economic Co-operation and Development (OECD) estimates that one-third of their countries' populations (primarily Europe, North America, Australia and Japan) have only a minimum standard of education making it difficult to retrain these citizens. They see the globalization of goods and services that started in the 1950s and 1960s now encompassing investments, people, and ideas crossing international boundaries. Globalization has been facilitated by market deregulation, such as the Canada-U.S. Free Trade Agreement, the spread of information through microelectronics such as the Internet and the globalization of financial markets as witnessed by the effect in Canada of the 1997 Asian market crash. There is a greater meeting of cultures as mass tourism continues to rise and more people emigrate. Globalization creates opportunities for economic growth and personal growth. Globalization also can increase a sense of vulnerability as new cultures interact and alter the once familiar patterns of living within the nation (OECD, 1996).

Information Age

The Information Age has provided greater opportunities for communication between nations and greater access to information through the information superhighways. Telecommunications is a rapidly growing industry supplying the infrastructure for globalization. It is a new world where knowledge and the control of knowledge have become the bases of power. A lifelong learning culture is emerging. Participation in this new world demands education and training (Statistics Canada, 1997).

Technological Change

We are entering an era where one thing is constant and that is change. The Adult Education and Training in Canada Report (Statistics Canada, 1997) predicts that technological changes will require 17 years of education and training by the year 2000 for 40 % of new jobs compared to 25 % in 1995. Because our demographics are moving towards an older working population, the present workforce must be retrained. Therefore the report concludes, "The continuous and effective upgrading of Canada's human resources has become an essential condition of ensuring long term growth and success in the global economy" (p. 5); however, in order to access training in this information age one needs to be literate.

Literacy

"What makes literacy so important in the current context is its potential to make societies more cohesive and give a country an economic advantage in the global markets of the information age" (Statistics Canada, 1996, p. iii). According to Statistics Canada (1996), several national literacy surveys, the Southam Literacy Survey in 1987, the Survey of Literacy Skills Used in Daily Activities by Statistics Canada in 1989, and the International Adult Literacy Survey in 1994 have provided a clearer picture of Canadian literacy. "...(T)he term "literacy" is used to refer to a particular mode of behaviour - namely the ability to understand and employ printed information in daily activities, at home, at work and in the community - to achieve one's goals, and to develop one's knowledge and potential" (Statistics Canada, 1995, p. 3).

The International Adult Literacy Survey conducted in 1994 (Statistics Canada, 1996) used this definition and measured an average adult's everyday literacy in the

domains of prose, document and quantitative literacy in Canada and six other industrial countries. There were some disturbing results for Canada. The survey indicated that 22 % of Canadians were at Level 1 (difficulty with most printed material), 26 % of Canadians were at Level 2 (can manage printed material that is simple and clearly laid out), 33 % of Canadians were at Level 3 (minimum considered necessary in an industrialized country), and 20 % of Canadians were at Level 4/5 (able to handle most printed information). The study found those differences in literacy skills mattered. They were strongly linked to employment, occupations, economic life opportunities and educational attainment. Adults with no secondary education were mostly at Level 1 and those with some secondary education were mostly at Level 2.

Adult Basic Education

Adult Basic Education (ABE) is a provincial program designed to help adults at Level 1 and 2, who lack literacy skills and a secondary diploma, achieve the academic prerequisites for technical or other post-secondary training. It is also used to prepare adults for employment through self-improvement and the development of living and social skills (SIAST, 1992). The current ABE program in Saskatchewan can trace its roots to the Canadian federal government's initiation of labour force skill training. In the late 1950's there was high unemployment and a need for a skilled labour force. Since the federal government was responsible for Canada's labour market, it took the lead in initiating adult skills training. It quickly discovered that adults often required upgrading so they could participate and benefit from the skills training. The federal government passed a series of vocational training acts to guide this training in the provinces; these became the impetus for Saskatchewan's vocational training programs (SIAST, 1992).

ABE was delivered first through technical institutions, and then through the community college system. In the four urban centers of Saskatoon, Prince Albert, Moose Jaw and Regina, ABE came under the Saskatchewan Institute of Applied Science and Technology (SIAST) when the urban community colleges were amalgamated with the four technical institutes in 1988.

Over the years the federal government has reduced its purchase of ABE training. The decline in the purchase of ABE training culminated in July, 1996, with the proclamation of the new Employment and Immigration Act, which prohibits the purchase of training by the federal government as of July, 1999. In response to this change in policy a federal-provincial agreement that turns training responsibilities over to the province was signed in February, 1998 (Mandryck, 1998). In preparation for this transition, the Department of Post-Secondary Education and Skills Training launched the Saskatchewan Training Strategy in 1997. It has a three-year implementation plan, which calls for partnerships between employers, communities and training institutions at the grassroots level. It focused on three goals:

Goal 1: Develop a skilled workforce relevant to Saskatchewan's labour market.

Goal 2: Enhance access and support opportunities for all learners.

Goal 3: Create a coherent, effective and sustainable delivery system.

The training strategy recognized,

> Basic education is the foundation that people need for employment, skills training and post-secondary education. It consists of fundamental knowledge and skills: communication, basic math, critical thinking, problem solving, teamwork, responsibility, initiative and independent learning. People create this foundation by obtaining a high school education, improving their literacy and language skills, developing social and life skills or employability skills and gaining work experience. (Saskatchewan Post-Secondary Education and Skills Training, 1997, p. 11)

The closer link between education and the ability to get a job is clearly reflected in the Statistics Canada Labour Force Survey of 1996. From 1990 – 1995 the survey shows a dramatic 30 % decline in employment for those with elementary education and a 20 % decline for people with some high school. These are the groups that include ABE students. On the other hand, university graduates experienced a 30 % growth and those with a post-secondary diploma had a 20 % growth in employment.

Adult Basic Education Students

Who are the adults in ABE and why did they leave school? According to SIAST (1994), 52 % of ABE students are of Aboriginal ancestry, 53 % are female and 19 % identify disabilities that would interfere with school. A 1992 SIAST review of ABE found that a majority of their students were on social assistance, single and under 30 years of age. The reasons that these students gave for leaving elementary/high school were as follows:

Found school work too difficult	4.56 %
Found school work too boring/school work irrelevant	9.37 %
Pregnancy	8.99 %
Found a job and thought I would finish school later	12.53 %
Asked to leave previous school/involuntarily left the school	3.16 %

Other reasons given included: had to help my parents, lack of emotional support, and attitudes of instructors. Now we will look at how these ABE student results compare with other studies of school leavers and their reasons for leaving.

School Leavers

Gilbert, Barr, Clark, Blue & Sunter (1993) summarized their review of the literature on school leavers this way:

> Many high-school non-completers come from low socio-economic backgrounds, from single-parent households, from basic or general academic streams/programs, have failed at least one course during their high school career, work for pay more than 15 hours a week, have low self-esteem, are frustrated learners with short-range rather than long-range goals, feel alienated from teachers, peers, and curriculum, and are concrete rather than abstract thinkers. Distinct differences between dropouts and graduates are apparent as early as Grade 3, in that dropouts exhibit academic difficulties and low achievement test scores. By Grade 9, a pattern of failing grades and high absenteeism is evident. There is also agreement that many non-completers have low class attendance rates, exhibit forms of deviant or delinquent behaviour, and in many cases, have been suspended from school at some point. (p. 4)

Gilbert et al.'s (1993) national study comparing school leavers and high school graduates 18 to 20 years of age, conducted in 1991 for Employment and Immigration Canada, found that one-fifth of young people did not graduate. Two thirds of the leavers had grade 10 or less and were 17 or younger when they left school. Of the Aboriginal 18-20 year-olds, 40 % were leavers compared to 16 % for the overall population. They were four times (16 % aboriginal versus 4 % general population) more likely to have dependents. The majority of leavers (69 %) came from high-risk groups (single-parent families, own family responsibilities, lower socio-economic groups and people with disabilities). According to the National Anti-Poverty Organization (1992), "It is poverty and other forms of inequality that create the barriers to good education for many Canadians" (p. 1). Leavers were also more likely to be involved in regular consumption of alcohol and drug use along with higher criminal convictions (excluding parking and speeding tickets). This is substantiated by the Saskatchewan Early School Leavers' Study (Cipywynk, Pawlovich, & Randhawa, 1983) which found that the most common

ways that early school leavers spend time together were drinking alcohol and/or taking drugs, going for coffee, driving around, partying, and playing sports.

Intake/Assessment Program at Wascana, SIAST

The Adult Basic Education Intake/Assessment program at Wascana Campus is designed to assist adult students returning to school by helping them to identify their strengths and weaknesses as learners and to identify what it will take for them to be successful in their training. The process reflects Sattler's (1992) Four Pillars of Assessment that include an interview, classroom observations, teacher-made tests and norm-referenced tests. The students begin academic work in reading, writing, spelling, and arithmetic at a level appropriate for each student. This provides the opportunity for the students and the instructors to make observations about their behaviour as students, and to monitor their progress through instructor made tests. Each students is interviewed to gather background information, to explore areas of the student's life that will support him, to identify any barriers that may deter him, and to explain norm-referenced tests in private (see Appendix A). Most important, the interview gives the students an avenue to share what they know about themselves and to identify what they need to be successful at school this time.

Five main areas of learning are addressed during the five-week Intake/Assessment class. These areas include: attendance, attitude, academic achievement and potential, addictions and attention. Concern about addictions and attention is based on norm-referenced screening tools, classroom observations and the interview. Information on ADHD is available in the classroom, and a video on ADHD followed by a discussion introduces the topic. If the screening indicates a risk for ADHD and/or Substance

Dependence, students are offered a summary package of their test results, and they are encouraged to talk to their family physician. They are also made aware of outside agencies that specialize in the diagnosis and treatment of ADHD and Substance Use Disorder. Identification and education of adults with ADHD is critical in treating ADHD (Hallowell & Ratey, 1995). Identification and treatment of ADHD and substance abuse may reduce the morbidity of both disorders (Wilens et al., 1994), and lead to a greater probability of educational success. To date there are no known studies that have focused primarily on ABE students and the percent of students at risk for ADHD and substance abuse or the correlation between the two.

Problem Statement

The purpose of this study was to investigate the incidence of, and the relationship between, ADHD and Substance Use Disorders among Adult Basic Education students. The subjects of this study were adult students who had generally not completed their grade 10, and were resuming their education by entering the Intake/Assessment class at Wascana Campus of the Saskatchewan Institute of Applied Science and Technology (SIAST) from August, 1996 to June, 1998.

Specifically, answers to the following questions were sought:

1. What is the incidence level of Attention Deficit/Hyperactivity Disorder in a selected sample of Adult Basic Education students and is this incidence level higher than that of the general population?
2. Is the incidence of Attention Deficit/Hyperactivity Disorder in the group related to age, gender or equity group? (According to SIAST (1994), there has been a comprehensive Education Equity Program at SIAST monitored annually by the

Saskatchewan Human Rights Commission since 1989. The goal is to achieve a student body that is representative of the Saskatchewan adult population. At present, special measures are available to persons with disabilities, Aboriginal peoples, members of visible minorities and women in predominantly male occupations.)

3. What is the incidence level of Substance Use Disorders in this sample and how does it compare to current estimates of Substance Use Disorders in the general population?
4. Is the incidence of Substance Use Disorders amongst Adult Basic Education students related to age, gender or equity group?
5. What is the incidence level of Attention Deficit/Hyperactivity Disorder and Substance Use Disorders appearing concomitantly in individuals in the Adult Basic Education population?
6. Are there age, gender or equity group differences for the Adult Basic Education population screened concomitantly for Attention Deficit/Hyperactivity Disorder and Substance Use Disorder?

Significance of the Study

Obviously there are a range of factors that result in leaving school and in choosing to return for a "second chance". It is a complex phenomenon. The present study was undertaken to investigate two underlying contributors, Attention Deficit/Hyperactivity Disorder (ADHD) and Substance Use Disorders (SUD), that may have made learning difficult and may continue to make learning difficult if not addressed in the ABE student population. Understanding the extent of ADHD and Substance Use Disorders in the ABE student population could lead to changes in program content, program delivery, and accommodations for students under the SIAST Education Equity program. It may

encourage specific counsellor interventions and follow-up. With early intervention and support ABE students may be more likely to achieve their goals.

Chapter 2: Literature Review

Historical Background

ADHD and Substance Use Disorders have had a variety of names. In recounting the history of ADHD, Jaffe (1995), and Weiss and Hechtman (1993) begin with a poem, and they credit the pioneer work of Still, Kahn, Cohen, Bradley and Strauss in the development of our understanding of ADHD. ADHD was recognized in the 1800's in a poem called "Fidgety Phil". George Still made the first medical description of the syndrome in 1902. Descriptions of children's symptoms after an epidemic of encephalitis in 1918 reflected Still's observations of hyperactivity, learning difficulties, conduct disorders, and poor attention. In 1934 Kahn and Cohen took a different view of these symptoms. They believed that these symptoms were organically based, and not only as the result of encephalitis. They felt that people possessed this "organic drivenness" from birth into adulthood (Jaffe, 1995). In 1937 Bradley successfully treated children with the stimulant Benzedrine. From the work of Strauss came the terminology Minimal Brain Damage Syndrome used from the 1940s to the 1960s. Later it was referred to as Hyperkinetic Reaction of Childhood, and in 1980 the disorder was reframed as Attention Deficit Disorder (ADD) with or without Hyperactivity to recognize the research that saw that cognitive disabilities of memory and attention were included (Kelly & Ramundo, 1993; Weiss & Hechtman, 1993). The Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) released by the American Psychiatric Association in 1994 adjusted the nomenclature to Attention Deficit/Hyperactivity Disorder (ADHD), and recognized that ADHD might not be identified until adulthood (Nadeau, 1995).

Diagnosing ADHD and Substance Use Disorders

Current Diagnosis Criteria for ADHD

In diagnosing for ADHD the DSM-IV (American Psychiatric Association, 1994) criteria require six or more symptoms of inattention and/or six or more symptoms of hyperactivity-impulsivity that have persisted over the last six months. Some of these symptoms need to have been present before seven years of age, to be present in at least two settings like home, school, or work, and to be causing significant problems in functioning socially, academically, or occupationally. Finally, they are not to be symptoms that better fit under another disorder. Following this diagnosis, attention deficit disorders are categorized as one of three types:

1. Attention-Deficit/Hyperactivity Disorder, Combined Type.
2. Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type.
3. Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type.

One study has raised concern regarding the validity of the age-of-onset for ADHD as established by the DSM-IV. Applegate, Lahey, Hart, Biederman, Hynd, Barkley, Ollendick, Frick, Greenhill, McBurnett, Newcorn, Kerdyk, Garfinkle, Waldman and Shaffer (1997) found that nearly all the youth of the predominantly hyperactive-impulsive type met the age-of-onset criteria of age seven, but 18 percent of the combined type and 43 percent of the predominantly inattentive type failed to meet the age-of-onset criteria. Barkley and Biederman (1997) argued for the abandonment of the age-of-onset of seven or at least a broadening of the criteria for diagnosis given this question of validity. They believe that it is questionable how accurately parents, let alone adults

seeking a diagnosis, can pinpoint the onset of ADHD. A failure to determine an age-of-onset at seven could mean many people going undiagnosed. Barkley and Biederman (1997) maintained that there is no historical, empirical, conceptual or pragmatic reason to maintain a precise age-of-onset. Historically, the age-of-onset was used only as a guideline based on expert opinion until 1980, when it became a diagnostic criteria. Empirically, Applegate et al. (1997) challenged the validity of the age-of-onset criteria. Conceptually, ADHD has been identified with childhood onset, but not by a precise age. Pragmatically, there is not much reason to establish an age-of-onset except to limit the number of people diagnosed, especially adults, effectively depriving them of access to help and the status of a disability. Hopefully, the age-of-onset criteria will be revised in future editions of the DSM.

Substance Use Disorders have been with mankind since before recorded history when it was discovered that fermented fruit and certain plants could produce euphoric states (Goode, 1995). The ancient Egyptians used and abused drugs. There is evidence that marijuana was used for medicinal purposes over 5000 years ago and opium was given around 1500 B.C. to settle crying babies. The impact of this early drug and alcohol use was diminished by their low potency. It was not until the last two hundred years that technological advances have led to more potent forms of alcohol and drugs and to greater availability (EduServ, 1988).

The invention of morphine in 1805, the hypodermic needle in 1834, and heroin in 1890 led the way into the era of greater potency. After the development of tranquillizers in the 1950s, the medical community began to use mood-altering drugs to treat mentally ill patients. By the 1960s pills in general became more acceptable as witnessed by the

widespread use of the birth control pill. The flower children of the 60s and 70s used drugs recreationally and experimentally. Today with harder economic times, substances are often used for escape or as a way to cope with frustration, desperation and alienation (EduServ, 1988; Goode, 1995). As with ADHD, Substance Use Disorder has had a plethora of labels including alcoholism, drug abuse, drug dependence, addictions, chemical dependence, psychoactive substance use disorder and the current Substance Use Disorders (Wilens, 1996). The Substance Use Disorders are categorized either as substance dependence or substance abuse. Although it is important to understand the difference, there was no attempt to distinguish between the two categories in this study.

Current Diagnosis for Substance Use Disorder

For substance dependence, the DSM-IV (American Psychiatric Association, 1994) requires a pattern of substance abuse over a 12-month period with at least three of the following symptoms: tolerance for the substance; withdrawal symptoms; using larger amounts of the substance than intended; desire for the substance or an inability to cut down; large amount of time spent using, obtaining or recovering from substance use; giving up important social, work or recreational activities because of substance use; and continuing to use a substance despite knowing that it is exacerbating physical or psychological problems. The substance abuse criteria of the DSM-IV (American Psychiatric Association, 1994) refers to a 12-month period of significant impairment that has one or more of the following symptoms: Failure to meet obligations at home, school or work because of substance use; recurrent substance use in dangerous situations; legal problems connected to substance use; and continued use in spite of social or interpersonal problems due to substance use.

How is ADHD Diagnosed in Adults?

"Attention deficit hyperactivity disorder (ADHD) is increasingly recognized as a legitimate adult diagnostic category" (Murphy & Barkley, 1996, p.393). Adults with ADHD have only recently been recognized (Wender, 1987) because it was believed that the disorder disappeared in adolescence. This is understandable, since one of the three key symptoms, hyperactivity, seemed to disappear in adolescence; however, in adults it manifests as restlessness and fidgeting such as a tapping finger or a swinging foot (Weiss, 1992). The second key symptom, inattention, is usually seen as a problem with concentration; however, Phelan (1990) cautions that this may not appear in novel, interesting, or intimidating situations, especially one-on-one. Zentall (1993) supports Phelan's observation and suggests that rather than calling it attention deficit, a more appropriate description would be attentional bias since a strong stimulus such as colour or movement can hold the concentration of a person with ADHD. Shaw and Giambra (1993) in their study of task-unrelated thoughts (TUTs) found that students with ADHD experienced spontaneous and uncontrolled TUTS when bored. The third key symptom, impulsivity, is demonstrated in acting or speaking without thinking. Ruben (1993) believes impulsivity may lead to behavioural problems associated with school failure, dropouts, delinquency, drug abuse, criminal and sociopathic behaviours. The poor impulse control in adults is expressed in such things as wild spending or drinking habits (Weiss, 1992). Other overt signs according to Weiss (1992) are poor performance in school and changing jobs frequently. It is the inner pain, according to Weiss (1992), that is the most disabling. It has resulted from the accumulation of failures that have taken a heavy toll on self-esteem and self-image. This is supported by Wender (1987) and

Hallowell & Ratey (1995), and is reflected in the book title by Kelly and Ramundo (1993), You Mean I'm Not Lazy, Stupid or Crazy?!

To assist with the diagnosis of ADHD in adults, Wender (1987) developed the widely used Utah Criteria for Adult ADHD. It is made of two parts, a childhood history and an adult history. The childhood history needs to have attention deficits and motor hyperactivity and at least one of the following: behaviour problems in school, impulsivity, overexcitability or temper outbursts. In the adult history there needs to still be attention problems and motor hyperactivity along with two of the following: affective lability, hot temper, stress intolerance, disorganization or impulsivity.

A second protocol used for the assessment of adult ADHD is Barkley's University of Massachusetts Medical College protocol (Barkley, 1990). Barkley's assessment looks for the presence of ADHD since childhood with current symptoms existing to a significant degree in at least five of the 14 criteria given in the DSM-IV. The symptoms should be currently causing significant impairment in performance in one or more areas of life such as job performance, school performance, managing home responsibilities, social acceptance or emotional adjustment. Finally, other disorders should be ruled out as the cause of the symptoms and any comorbid disorders need to be identified. These conclusions are reached by gathering a detailed history through a one to two hour interview that includes medical and school history. During the interview the clinician is differentially diagnosing for the presence or absence of other disorders. To this end a standardized personality inventory such as the Minnesota Multiphasic Personality Inventory (MMPI) is considered helpful. In addition, Barkley's protocol would include a standardized intelligence test and measures of academic achievement in

reading, spelling and mathematics to identify any mental or developmental delay or retardation, and to indicate if there is a Learning Disability. Corroborating evidence is sought by interviewing someone who knows the person well.

Brown (1995) has proposed an expanded construct of ADHD that incorporates some cognitive and affective symptoms that are often reported by patients. He conceptualizes ADHD as five core clusters that more accurately reflect ADHD symptoms. These clusters include problems in:

1. *Activating and organizing to work*: i.e., trouble getting organized and started on tasks.
2. *Sustaining attention*: i.e., daydreaming and losing track when reading.
3. *Sustaining energy and effort*: i.e., daytime drowsiness and trouble maintaining consistent work production.
4. *Moodiness and sensitivity to criticism*: i.e., difficulties with irritability and lack of motivation.
5. *Memory recall*: i.e., forgetfulness and difficulty remembering names, dates or information at work (p. 101).

Hallowell and Ratey (1995) have also developed their own adult criteria. It does not require the presence of hyperactivity as does Wender's criteria. The Hallowell and Ratey (1995) Criteria for Attention Deficit Disorder in Adults requires 15 of the following:

1. Sense of underachievement.
2. Difficulty getting organized.
3. Chronic procrastination or trouble getting started.
4. Many projects going simultaneously; trouble with follow-through.
5. Tendency to say what comes to mind without considering timing or appropriateness.
6. A frequent search for high stimulation.
7. An intolerance for boredom.
8. Easy distractibility, trouble focusing attention, tune out or drift in the middle of a page or conversation and yet have the ability to hyperfocus at times.
9. Often creative, intuitive, highly intelligent.
10. Trouble going through proper channels.
11. Impatient.
12. Impulsive: changing plans, spending.

13. Tendency to worry.
14. Sense of insecurity.
15. Mood swings.
16. Restlessness.
17. Tendency toward addictive behaviours like drinking, gambling and eating.
18. Poor self-esteem.
19. Inaccurate self-observation.
20. Family history of ADD, manic-depression, depression, substance abuse or disorders of impulse control (p. 201).

Hallowell and Ratey also looked for a childhood history of ADHD symptoms. These different approaches to the diagnosis of adult ADHD reflect the current pioneering stage for adult ADHD.

A final word of caution around diagnosing is related to the impact of books on ADHD such as the bestseller, Driven to Distraction (Hallowell & Ratey, 1995). Although these books have played a key role in bringing adult ADHD to public awareness, they have helped to popularize ADHD. Often people have self-diagnosed by doing questionnaires in books and magazines. Biggs (1995) is concerned that people may jump on this since it is less stigmatizing when in fact they may have more serious disorders, and Shaffer (1994) fears that patients are seeking a biological cause for whatever troubles them. Shaffer (1994) sees three diagnostic problems for adult ADHD. The first problem is establishing a childhood history; the second problem is the high level of comorbid disorders; and finally there is the issue of other disorders that mimic ADHD.

Conditions that may Resemble, Accompany or Mask ADHD

In making the difficult diagnosis of ADHD, a physician must use a process called differential diagnosis whereby he rules out conditions that share some of the ADHD symptoms and look for comorbid or coexisting disorders that may be masking the ADHD (Hallowell & Ratey, 1995). "A good differential diagnosis is important because the

symptoms of ADHD are very nonspecific and can be symptomatic of other psychiatric illnesses" (Tzelepis, Schubiner & Warbasse, 1995, p.36). Inattentiveness for example, can be associated with mood disorders, anxiety disorders, schizophrenia, and chronic physical and sexual abuse. "Therefore, a primary goal of the ADHD evaluation is to determine whether ADHD symptoms may be explained by other psychiatric phenomena" (Tzelepis et al., 1995, p. 36). Hallowell and Ratey (1995) provide a more extensive list of conditions that may accompany, resemble or mask ADD.

Equally important is the investigation for comorbid or coexisting psychopathology. The maladaptive lifestyle of individuals with ADHD may lead to the development of psychiatric conditions such as mood disorders, substance abuse and antisocial behaviour (Biederman, Newcorn & Sprich, 1991). In one self-referred clinical population over half (61 %) of the adults with ADHD had additional comorbid disorders (Tzelepis et al., 1995). Considering the ABE student population, a few of these disorders that may resemble, accompany or mask ADHD warrant more elaboration.

Posttraumatic Stress Disorder (PTSD). The stories ABE students relate often involve growing up in violent, abusive homes where they may have experienced serious personal injury or threat. Physical abuse, verbal abuse, sexual abuse and incest are reported. A response to such experiences may lead to symptoms of PTSD which resemble some of the ADHD symptoms. They may suffer from hyperarousal or hypervigilance, trouble modulating feelings, a lack of concentration or focus, sleep disturbances, and memory or information-processing problems (Briere, 1992; Hallowell & Ratey, 1996).

Depression. Restlessness, distractibility and sleep problems are shared symptoms between ADHD and those who are depressed (Tzelepis et al., 1995). Ratey, Greenberg, Bemporad, and Lindem (1992) claim that many adults are diagnosed with depression or anxiety disorders prior to their diagnosis of ADHD. Many ABE students report receiving treatment for depression or they score high on the Burns (1993) Depression Scale.

Anxiety. The overlap of anxiety symptoms with ADHD include restlessness, fatigue, difficulty concentrating, irritability, muscle tension and sleep disturbance (Tzelepis et al., 1995). Hallowell and Ratey (1995) observe that anxiety may be a logical outcome if associated with ADHD because of frequent forgetfulness, daydreaming, being impulsive or late constantly. There may be a more hidden connection where ADHD people respond to the chaos in their lives by latching on to worries to organize their lives. Jensen, Martin & Cantwell (1997) believe that this combination of ADHD and anxiety is a disorder in itself and not a comorbid relationship. Again, ABE students report high anxiety including panic attacks, and they frequently score high on the Burns (1993) Anxiety Scale.

Learning Disabilities. According to Pennington (1991) Learning Disabilities is a subset of the broader term Learning Disorders. "By definition, a learning disorder involves dysfunction in one or more neuropsychological systems that affect school performance. A child can have poor school performance without having a learning disorder, when the poor school performance is due entirely to emotional, motivational, or cultural factors" (p. xii). Pennington found learning disabilities too restrictive, since he felt that we need to understand why there is a learning problem in order to devise a

treatment plan. Generally, ABE students have had learning problems, so the challenge is to discover the source of these problems. In the ABE Equity Education Needs Assessment Report (Stonehouse, 1995) at SIAST, Wascana Campus, 19 percent of ABE students self-identified as having a learning disability.

Pennington (1991) identified ADHD as a specific learning disorder that is only preceded by dyslexia and other language disorders in frequency. He identified five domains of brain function with their related disorders as the ones that account for learning disorders: phonological processing (dyslexia), spatial reasoning (specific math/handwriting), long-term memory (amnesia), social cognition (autism) and executive functions (ADHD). ADHD seems to result in breakdowns in executive functions that are believed to be located in the frontal lobes of the brain. Pennington (1991) described executive functions as an umbrella term for the processes that include planning, organizational skills, selective attention and inhibitory control. Besides ADHD, lack of executive function is connected to schizophrenia, Tourette's syndrome and autism (Pennington, 1991).

Fetal Alcohol Syndrome. Streissguth (1994) credits the first identification of Fetal Alcohol Syndrome (FAS) in 1968 to Lemoine in France and the naming of the condition to Jones and Smith of Seattle who coined the term FAS in 1973. FAS is a disabling condition that is the effect of a mother drinking alcohol during her pregnancy. The alcohol in the mother's system crosses the placenta into the fetus' bloodstream. The alcohol remains longer in the unborn baby's body because its developing liver cannot process the alcohol quickly, consequently damaging the developing fetus. The characteristics of FAS include growth deficiency, facial abnormalities, and central

nervous system dysfunction including delayed development, hyperactivity, coordination difficulties, learning or attention problems, seizures and mental retardation (Streissguth, 1994). Although there is no predicting which fetus will be affected, The Saskatchewan Institute on Prevention of Handicaps (1997) pamphlet identifies four factors that influence how severe the damage will be to the fetus. These increased risk factors include the amount of alcohol consumed, particularly heavy drinking and binge drinking, consuming alcohol in the first three months of pregnancy, genetic susceptibility to alcohol and the level of nutrition throughout the pregnancy.

According to Streissguth (1994) long-term consequences of FAS have been documented by several groups such as those led by Lemoine and Streissguth in their longitudinal studies. Although the physical features dissipate after puberty, the central nervous system problems persist. IQ scores seem to remain stable averaging at 66. However, Streissguth (1994) also found a wide range of IQ scores with 42 percent not in the retarded range. Many persons with FAS have trouble with daily living skills, particularly communication skills.

Streissguth (1997) presents seven prevalent Myths about Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE):

1. People with FAS/FAE always have mental retardation.
2. The behavior problems associated with FAS/FAE are the result of poor parenting or a bad environment.
3. Admitting that children with FAS/FAE have brain damage means that society has given up on them.
4. Children eventually outgrow FAS/FAE.
5. Diagnosing children with FAS/FAE will thwart their development.
6. It is useless to diagnose FAS/FAE because there is no "real" treatment approach.
7. People with FAS/FAE are unmotivated and uncaring, always missing appointments or acting in ways that society considers irresponsible or inappropriate (p. 121).

By debunking these myths, Streissguth (1997) believes that these people with FAS/FAE will receive the treatment and support they deserve as members of our society.

The first Canadian report on provincial incidence rates of FAS was done from 1992-94 in Saskatchewan by Habbick, Nanson, Snyder, Casey, and Schulman (1996). Habbick et al. (1996) report that the incidence rates in 1988-1992 at 0.589 per 1000 live births have not fallen from 1973-1977 levels (0.515 per 1000 live births). Of the 207 cases in their study, 68 individuals or 33 percent were also diagnosed with ADHD and 86 percent were Aboriginal, which is high given 15 to 20 percent of births in Saskatchewan are from the Aboriginal group. Habbick et al. (1996) believed that these results underestimated the prevalence of FAS in Saskatchewan because of cases that remain undiagnosed especially those born prior to 1970. This study did not include those with Fetal Alcohol Effects (FAE) or alcohol-related birth defects, which they believed exist at three to four times the incidence of FAS.

Substance Abuse. ABE students' stories are frequently filled with reminiscences of alcohol and substance abuse in their homes. Therefore, FAS or their own substance abuse issues have to be considered as a possible life outcome that may be interfering with their ability to learn. Alcohol and marijuana seem to be the most widely used, so they demand extra scrutiny.

Male offspring of alcoholics are four to six times more likely to develop alcoholism than sons of nonalcoholics (Tarter, Kabene, Escallier, Laird & Jacob, 1990). Besides this apparent genetic link Tarter et al.(1990) identified temperament traits that would suggest that alcoholism was a disorder of self-regulatory behaviour reflected in higher activity levels for sons of alcoholics. Phil, Peterson & Finn (1990) concurred with

these findings of an inherited predisposition to alcoholism and hyperactivity in the sons of alcoholics. They added that conduct disorders and poorer academic performance are also prevalent outcomes for sons of alcoholics. Phil et al. (1990) indicated that 5 to 10 percent of adults abuse alcohol with males outnumbering females three to one. It is interesting to note that these are the same gender differences given by Barkley (1994) for ADHD diagnoses.

Besides having a negative impact on health, alcohol results in cognitive deficits including abstraction, perceptuospatial tasks, problem-solving skills and memory (Mearns & Lees-Haley, 1993; Schandler, Cohen, & Antick, 1992). The recovery of functions occurs most rapidly after the first two weeks of abstinence; however, half of the alcoholics show some impairment after three to four years of abstinence with alcoholics over 40 often having permanent damage (Mearnes & Lees-Haley, 1993).

Chronic marijuana use can lead to cognitive deficits as well as amotivational syndrome. Research shows that marijuana interferes with arithmetic reasoning, problem-solving and short-term memory (Millsaps, Azrin, & Mittenberg, 1994; Restak, 1994). Long-term marijuana users may also become apathetic and lose motivation resulting in amotivational syndrome (Goode, 1995). According to Wilens (1996), marijuana is the most commonly abused drug by people with ADHD.

In examining substance abuse it is important to reflect on the people who were part of this study. The majority of ABE students are Aboriginal. As referenced in the Indian and Northern Affairs Backgrounder (1998), the Aboriginal People's Survey by Statistics Canada in 1991 stated that 62 percent of First Nations' people over the age of 15 identified alcohol as an issue for Aboriginal people and 48 percent identified drug

abuse as an issue. In the literature, alcoholism amongst Aboriginal people is called an epidemic (Napoleon, 1991; Westermeyer, 1996).

Napoleon (1991), a Yup'ik Eskimo from Alaska, gives a poignant account of the source of this epidemic. He believes that it began with the Great Death, the horrific influenza epidemic of 1900, which killed 60 percent of the First Nations people in Alaska. Aboriginal people had no immunity to influenza or other European diseases such as smallpox and later, tuberculosis. Families and communities were wiped out. Many children were orphaned. In response to such loss many survivors suppressed what had happened. Napoleon believed they were suffering from what we would identify today as Posttraumatic Stress Disorder (PTSD). "Because of his guilt, the person suffering from PTSD does not like himself. He is ashamed of himself, ashamed of what he saw or participated in, and is haunted by the memory, even in sleep. He becomes withdrawn, hypervigilant, hypersensitive, and is constantly living in stress" (Napoleon, 1991, p. 14). Reeling from this experience, First Nations people were ill-equipped to respond to moves by the government and missionaries to educate First Nations children in residential schools. "Efforts such as residential schools have done much harm by undermining traditional strengths and have served through a "blaming the victim" process as a means of putting negative labels on First Nations people..." (Hampton, Hampton, Kinunwa & Kinunwa, 1995, p. 262). Residential schools' policies such as forbidding the use of the children's mother tongue or traditions have been described by several authors as cultural genocide (Chrisjohn & Young, 1997; Napoleon, 1991). As a way to ease the pain Napoleon says, "...these Eskimos found in liquor a narcotic which numbed their troubled minds" (p. 16). For Napoleon the main cause of alcoholism is cultural genocide and the

resulting death of the spirit; the way out of the abyss is a spiritual journey led by First Nations self-government and the use of Talking Circles for people to share their stories and begin the healing process.

Walker, Lambert, Walker, Kivlahan, Donovan and Howard (1996) in their study of American urban Indian adolescents identified suicide, school drop out and unsafe sex as the legacy of alcohol abuse. Suicide rates for youth 15-24 were nearly three times the national rates. Thirty-five percent of Indian high school students in Seattle dropout compared to 20 percent for Blacks and 15 percent for the whole district. Beauvais (1996) found dropout rates of 50 %. Sexual activity increases dramatically with substance use and Walker et al.(1996) documented high-risk (unprotected) sexual activity in Indian adolescents which raises the fear of AIDS. Beauvais (1996) concurred with these findings in his 20-year research that followed trends in drug use from 1975- 1994 amongst American Indian students and dropouts. The general pattern showed a sharp increase in drug abuse in the late 1970s surpassing and remaining above the national average. The pattern levelled off in the 1980s and then began a slight decline until 1992. Beauvais (1996) found that Indian youth show a high rate of drug use compared with their non-Indian peers resulting in 20 percent of Indian youth, especially amongst school dropouts, being heavily involved in drugs.

ADHD Causes, Relationship with SUD and Impact on Adults

Causes of ADHD

The cause of ADHD has been elusive. Current research suggests a neurobiological connection with strong evidence of a genetic influence (Quinn, 1995; Weiss & Hechtman, 1993). The frontal lobes of the brain are thought to be involved.

They perform executive functions such as attention to the environment and to tasks, self-motivation, self-correction and goal formation. (Koziol, 1993; Quinn, 1995; Weiss & Hechtman, 1993). The neurotransmitters, particularly norepinephrine, dopamine and serotonin, are important (Weiss & Hechtman, 1993). These neurotransmitters are the chemical connectors between nerve cells. If too little of the neurotransmitter is released then the second cell picking it up may not fire properly and hence that portion of the brain will not function correctly. The catecholamine (neurotransmitter system) dysregulation hypothesis is that people with ADHD are deficient in some neurotransmitters (Wender, 1987). New noninvasive technology such as brain scans have allowed researchers to look at how the anatomical structures of the brain function which has led to the theory of frontal lobe disinhibition. Zametkin, Nordahl, Gross, King, Semple, Rumsey, Hamburger and Cohen's (1990) landmark study of brain metabolism showed that glucose metabolism was lower in ADHD adults with hyperactivity than adults without ADHD. A significant area that was affected by this underactivity was the frontal lobes. The frontal lobes are thought to be the source of executive function, so if the frontal lobes were not functioning properly they could fail to inhibit emotional and cognitive responses as well as behavioural impulses. Thus evolved the theory of disinhibition of the frontal lobes. Since dopamine and norepinephrine are believed to assist with information processing and they respond to stimulant medication, it is felt that their dysregulation compromises the functioning of the frontal lobes leading to an integration of the two ADHD theories (Quinn, 1995).

Barkley (1997) proposed a unifying theory for ADHD based on ADHD being a deficit in behavioural inhibition. In his theoretical model, he linked inhibition to four

executive neuropsychological functions: 1) working memory, 2) self-regulation of affect-motivation-arousal, 3) internalization of speech, and 4) reconstitution or behavioural analysis and synthesis. Barkley drew on research in neuropsychology and developmental psychology for evidence to support his idea of behavioural inhibition in ADHD. He noted that ADHD children talk more or talk out loud to themselves. They will blurt out and interrupt the conversation of others. ADHD people have trouble conforming to instructions, deferring gratification, and resisting temptation. The performance of people with ADHD on continuous performance tasks is worse than people without ADHD. This results in more impulsive errors. Behavioural inhibition also seems to be supported by the difficulty experienced by people with ADHD to maintain task performance in the face of distractions such as on the Stroop Colour-Word Interference Test.

Barkley (1997) proposed that trouble with behavioural inhibition affects working memory. This is the ability to hold a piece of information in your mind without any outside clues and to use this information to give a response. It is the ability that is tested when one is asked to repeat a series of digits often in reverse order or to do mental arithmetic. These are often difficult tasks for those with ADHD.

Inhibition, Barkley (1997) believed is also critical to self-regulation. Irritability, excitability and hostility are frequent descriptors for people with ADHD who struggle to self-regulate emotion. Lack of motivation is also often attributed to people with ADHD when they are required to complete repetitive tasks. Self-regulation of arousal has been implicated by brain scans that indicate underactivity in the frontal lobes of those with ADHD.

Barkley (1997) saw inhibition as a part of our internalized speech. This is the

ability to talk to ourselves as we apply rules to govern our behaviour or to use moral reasoning. It helps us to be reflective in our problem solving. This appears to be not as well developed in people with ADHD.

Finally, Barkley (1997) saw inhibition interfering with the ability to analyze and synthesize information, which he refers to as reconstitution. This ability, which is necessary in problem solving, is often compromised in people with ADHD. Ultimately, Barkley believes that inhibition in combination with the four described executive functions contributes to greater control of motor actions. He believed that there is a motor control deficit in those with ADHD. Consequently, this leads to impulsive, often inappropriate, responding.

Furthermore, Barkley (1990) reported that 80 % to 100 % of ADHD cases may be genetically based with 35 % to 45 % of parents and 25 % to 35 % of siblings sharing the ADHD disorder. Boys with ADHD outnumber girls 3:1(Barkley, 1992). The four types of studies that have shown this genetic connection have included twin, sibling, adoption, and family studies (Gilger, Pennington & Defries, 1992; Morrison & Stewart, 1971; Weiss & Hechtman, 1993).

Relationship of ADHD and Substance Use Disorder

Work by Blum, Cull, Braverman and Comings (1996) suggested a genetic link for alcoholism and a connection to ADHD:

> In the course of our work we discovered that the genetic anomaly previously found to be associated with alcoholism is also found with increased frequency among people with other addictive, compulsive or impulsive disorders. The list is long and remarkable-it comprises alcoholism, substance abuse, smoking, compulsive overeating and obesity, attention-deficit disorder, Tourette's syndrome and pathological gambling. (p. 1).

Blum et al. (1996) believed that these disorders are linked by a common 'hard-

wired' system in the brain that provides pleasure as a reward for certain behaviour. When the pleasure and reward system breaks down due to an inborn chemical imbalance, the behavioural disorders appear. This breakdown has been called the *reward deficiency syndrome*. The chemical they believe is primary for transmitting reward is dopamine, and this is the chemical that is found lacking in the above disorders. "The concept of a reward deficiency syndrome unites these disorders and may explain how simple genetic anomalies give rise to complex aberrant behavior" (p. 2).

Of those adults with persistent ADHD symptoms 20 to 40 percent may develop psychoactive substance use disorders (PSUD) (Mannuzza et al., 1993; Weiss, 1992). Wilens et al. (1994) reported the following relationship between ADHD and PSUD:

1. a high bi-directional overlap between ADHD and substance use disorders in studies of people with ADHD and in studies of people with substance use disorders.
2. persistent ADHD may be a risk for substance use disorders in adolescence and adulthood.
3. high rates of ADHD symptoms are reported in children who develop substance use disorders.
4. higher rates of substance use disorders have been found in relatives of people with ADHD and higher rates of ADHD are found in relatives of people who have substance abuse disorders.
5. the association between ADHD and substance use disorders seems to be mediated by comorbid (coexisting) disorders, especially conduct disorder and antisocial disorder. Anxiety and mood disorders, especially bipolar disorder,

may also increase the risk for substance use disorders.

6. the self-medication hypothesis (Khantzian, Gawin, Kleber & Riordan, 1984) may explain substance abuse among people with persistent ADHD and comorbid disorders.

"Since the risk for PSUD has been shown to be elevated in adults with ADHD when compared with controls, a sharp increase in PSUD is to be expected in grown-up ADHD children during the transition from adolescence to adulthood" (Biederman, Wilens, Mick, Farone, Weber, Curtis, Thornell, Pfister, Jetton & Soriano, 1997, p. 21). ADHD by itself has been shown to be a significant risk factor for Substance Use Disorder (Biederman, Wilens, Mick, Milberger, Spencer & Faraone, 1995).

In seeking relief from a life of frustration, it is not uncommon for ADHD adults to turn to alcohol or drugs (Murphy & LeVert, 1995; Wilens, 1996). "Of the many masks that ADD wears, substance abuse is one of the most difficult to see behind because the substance abuse itself causes such problems...ADD is one of the underlying causes of substance abuse that is particularly important to look for, because it can be treated" (Hallowell & Ratey, 1995, p.172). According to Hallowell and Ratey (1995) many people with ADD are using substance abuse as a form of self-medication to ease their dysphoria. Cocaine, being a stimulant, can help ADD people feel focused and alcohol and marijuana help to quiet the internal noise that often plagues those with ADD. Unfortunately, this is only short-term relief and there are the dangerous complications of addictions such as body damage, increased anxiety and loss of motivation. Treatment for ADHD as well as the addiction reduces the chance that the addict will go back to abusing (Hallowell & Ratey, 1995). Wilens (1996) recommended the order of treatment needs to

begin with getting the substance abuse under control, then addressing any coexisting mood disorders and finally treating the ADHD if the symptoms still exist. Riggs (1998) disagreed with this sequential treatment amongst adolescents with substance use disorders. She believed that a concomitant treatment is more effective since substance-abusing adolescents with ADHD may not be able to benefit fully from the treatment for addictions because of their distractibility, hyperactivity and impulsivity. Once serious substance abuse is reduced through family therapy and cognitive-behavioural techniques, Riggs begins cautious, supervised psychopharmacological treatment using drugs with lower abuse potential such as pemoline or buproprion.

Impact of ADHD on Adults

The experience of living with ADHD has been described by some adults as "living with a cluttered mind" (Atkins, 1996) or "living in a fog" (Murphy & LeVert, 1995). Hallowell and Ratey (1995) compare ADHD to being near sighted. Both conditions need help with focusing. Barkley (1994) described five primary behavioural problems: attention impairment, decreased ability to control behaviour, excessive movement or hyperactivity, inability to follow instructions and rules, and inconsistent work performance.

Barkley (1994) described the first problem as **attention impairment** or difficulty with sustained attention, attention span or persistence of effort. "People with ADHD struggle, sometimes mightily, to maintain their attention toward activities that are longer than usual, boring, repetitious, or tedious" (p. 5). Adults with ADHD report trouble with uninteresting work, educational tasks, routine household chores, reading long uninteresting books, following directions, or finishing lengthy home projects. Although

others may see them as easily distracted by stimuli in their environment, Barkley's work suggests it is more a matter of becoming easily bored and seeking more interesting things to do. He sees the problem with distractibility to be one of behavioural inhibition or the desire to engage in more stimulating or fun activities. Boredom or finding school work irrelevant or uninteresting was a common theme in the leaver follow-up surveys discussed above.

A second problem for ADHD adults is the **decreased ability to control behaviour.** "Those with ADHD have considerable problems with stopping to think before they act, with waiting for events or activities to take place, and with putting aside what is of interest to them now in order to work toward longer-term, larger rewards or consequences that are personally, occupationally, or socially important" (Barkley, 1994, p.6). It is also difficult for ADHD adults to be patient. Their impulsivity can be seen in greater risk-taking behaviour and opting for short-term rewards or taking short cuts. One example is pregnancy outcomes for leavers which suggests impulsive behaviour that did not weigh the consequences. Adopted children, frequently the offspring of teenage pregnancies, have a higher risk for ADHD (Kelly & Ramundo, 1993).

Barkley (1994) identified **excessive movement or hyperactivity** as the third problem behaviour for ADHD adults. This can be seen in restlessness, fidgeting, locomotor activity or excessive talking. When required to sit for a long time ADHD adults often shift in their seats, tap their fingers, or jiggle their feet. If they have to wait in line, they can get very restless or frustrated. At work their restlessness may lead to frequent breaks and low productivity. It is this constant motion that may have drawn teachers' attention when they were younger and their inability to comply with school routines could lead to

disciplining, failure to complete school tasks, and at times to grade repetitions. Leavers have a pattern of failing grades and disciplinary problems.

The fourth problem identified by Barkley (1994) for ADHD adults was an **inability to follow instructions and rules.** This behaviour can lead to serious problems at school and at work because the individual is frequently off-task. "The general impression left with others, at best, is that the person with ADHD is less mature and lacks self-discipline and organization. At worse, it implies that the person with ADHD is intentionally lazy, unmotivated and trying to avoid his or her responsibilities" (p. 8). Not following rules at school can lead to reprimands that escalate to delinquent behaviour and end in suspensions, which are not uncommon experiences for school leavers.

The fifth behaviour Barkley (1994) said causes problems for ADHD adults is **inconsistent work performance**. The work performance can be variable. Some days assigned work is completed and other days very little is accomplished. This variability is often reflected in teacher comments on report cards such as not achieving potential or capable of much more. There seems to be a problem for ADHD adults with persistently giving a steady work performance over time.

These five behaviour areas of ADHD adults are often referred to as "executive functions" since they are critical to organizing oneself and performing complex behaviour over extended periods of time. Difficulty in controlling executive functions leads to problems in life. "In summary, ADHD is not a problem of knowing what to do; it is a problem in doing what you know. This is a problem of sustaining effort over time and of inhibition.... (I)t is a biological problem involving an underactivity in those parts of the brain responsible for sustaining motivation or effort over time and maintaining

inhibition over behavior" (Barkley, 1994, p.10). Longitudinal studies (Mannuzza et al., 1993; Weiss & Hechtman, 1993) have helped to identify how these behaviours manifest themselves in three areas of adult life: interpersonal skills, academic achievement and professional development.

Interpersonal Skills. It is not surprising, when you have trouble maintaining attention, to listen, are reacting impulsively, and always on the go, that you might rub people the wrong way. When parents and teachers have been constantly trying to change this behaviour, it can lead to tension and oppositional responses (Weiss & Hechtman, 1993). Mannuzza et al (1993) found that hyperactive children were 10 times more likely to develop an antisocial personality disorder in adulthood often leading to incarceration. ADHD personalities can be unpredictable, disorganized and frequently hot-tempered making intimate relations very stressful and difficult to maintain, so the relationships frequently fail (Weiss, 1992).

Academic Achievement. Difficulty with attention makes learning difficult and can create gaps in basic skills. Mannuzza et al (1993) found that nearly one quarter of hyperactive boys did not complete high school compared to 2 % of the controls. Weiss and Hechtman (1993) in Canada discovered educational underachievement and a high school drop out rate of 32 %. Learning difficulties are compounded when learning disorders such as dyslexia exist as they do for 30 percent of those with ADHD (Murphy & LeVert, 1995). Poor academic achievement and a sense of underachievement can result in feelings of low self-esteem (Murphy & LeVert, 1995; Hallowell & Ratey, 1995).

Professional Development. The development of one's profession or job status is bound to be affected by one's level of education, self-esteem and interpersonal skills.

Although Mannuzza et al (1993) found 90 percent of ADHD men were employed, they had attained lower occupational rankings. Hallowell and Ratey (1995) and Murphy & LeVert (1995) reported from their clinical work that many of these ADHD adults are unsatisfied with their work position.

ABE Students with ADHD and Substance Abuse

An ABE Equity Education Needs Assessment Report (Stonehouse, 1995) revealed that 6.56 % of the student population self-identified as having Attention Deficit/Hyperactivity Disorder (ADHD) and 5 % self-identified drug and alcohol abuse as a barrier. In addition, 16.4 % said they had a learning disability (Stonehouse, 1995). This is higher than the Learning Disabilities Association of Canada's (1997) estimate that, "Approximately up to 10 percent of Canadians are thought to have some kind of learning disability ~ be it dyslexia, Attention Deficit Disorder, or another form of neurological impairment" (Learning Disabilities Association of Canada, National, vol. XXXIV, No. 3, p.8). It is estimated that 25 % of people with ADHD have co-occurring learning disabilities (LD) and 33 % of people with LD have ADHD (Barkley, 1991; Semrud-Clikeman, Biederman, Sprich-Bucminster, Lehman-Krifcher, Farone & Norman, 1992). Estimates of the prevalence of ADHD in the school age population range from 3 % - 5 % (Barkley, 1991; American Psychiatric Association, 1994; Fowler, 1992) with 66 % continuing to show symptoms into adulthood (Weiss & Hechtman, 1993). Therefore, ADHD may affect 2 to 3 percent of adults (Wilens, Biederman, Spencer & Frances, 1994).

School failure and lower levels of education are often outcomes for students with ADHD (Weiss & Hechtman, 1993). Adult Basic Education students at SIAST Wascana

Campus do not have their grade 12 and half do not have grade ten. They are returning because education requirements have risen. The grade eight that was adequate to secure employment 40 years ago is no longer enough. Those who left school early fit into five categories: 1) disadvantaged students economically and/or socially; 2) creative independents who felt confined by the structure of the classroom; 3) vocationally focused who saw the workplace as more attractive than school; 4) visible minority leavers; and 5) critical event leavers who left because of personal and family events (Saskatchewan Education, 1992).

It is important to remember that it was not until the 1980s that schools established criteria for a learning disability. ADHD was included under learning disabilities. The criteria for a learning disability generally involved a discrepancy range between aptitude and achievement scores to qualify for help. Since time lag is one of the debilitating features of ADHD because the central nervous system responds slowly, ADHD children would rarely demonstrate their knowledge on standardized tests; they would run out of time (Runyan, 1992). This means that many ADHD children slipped through the cracks (Jordan, 1992). It was also not until 1980 that the Diagnostic and Statistical Manual of Mental Disorders (DSM III) acknowledged Attention Deficit Disorder without hyperactivity and Attention Deficit Disorder residual type. Then in 1987 the American Psychiatric Association went back to the one label of Attention-Deficit-Hyperactivity Disorder (ADHD) which made it hard for specialists to justify the non-hyperactive types (Jordan, 1992). It is this difficulty with diagnosis and the fact that it is very complicated to uncover ADHD (Kelly & Ramundo, 1993) that has led Hallowell & Ratey (1995), who believe that we are only beginning to appreciate how extensive ADHD is, to estimate it

affects 10 million American adults.

It seems likely that a significant proportion of the ABE student population are struggling with the symptoms of ADHD for several reasons. These reasons include: the difficulty with diagnosis, the long held belief that ADHD had to include hyperactivity and that ADHD would disappear by adulthood, the high incidence of comorbidity with learning disabilities and substance use disorders, the high percentage of those self-identifying in ABE plus the obvious outcome of low education. ABE students require better entry assessment and changes in programming to be successful (Saskatchewan Education, 1992). As one ABE student with ADHD reflected, " I need smaller classes with more opportunity to ask questions. I need to see the steps laid out in sequence. If I could have a quiet space, I would do better. Going home is better than staying in the Learning Centre. People round talking makes it really hard to stay on task. When I self-identified, I thought there might be follow-up, but there wasn't" (Stonehouse, 1995, p.9).

Treatment of ADHD and Substance Abuse

Treatment for ADHD and substance abuse requires a multi-modal interdisciplinary approach (Fowler, 1992; Wilens et al., 1994). According to Hallowell and Ratey (1995) this involves five components. The first component is diagnosis because with diagnosis comes a great sense of relief to finally have a name for the symptoms. Education is next, since the more one knows and understands the better equipped one is to deal with his life, and it helps with explaining it to others. The third component to treatment involves structuring and creating some limits. Coaching and/or psychotherapy will provide the support, encouragement and structure to lead to successful changes. Finally, medication can help to correct a chemical imbalance and

provide relief and focus.

Diagnosis

Differential diagnosis is critical since many disorders share the ADHD symptoms as discussed above. In school settings there is often a failure to distinguish ADHD from specific learning disabilities (SLD) and serious emotional disturbance (SED). There are several key points to consider in distinguishing between ADHD and SLD. The inattention and impulsivity of ADHD are not the result of a language processing problem, but rather ADHD is more likely to affect performance in terms of productivity and accuracy because of poor planning and a lack of organizational skills (Fowler, 1992; Semrud-Clikeman et al., 1992). In distinguishing between ADHD and SED it must be remembered that ADHD is not characterized by moods of unhappiness or depression and most cases of ADHD do not have coexisting disorders associated with emotional stress (Fowler, 1992). Still there is often comorbidity with the presence of more than one disability. Learning disabilities co-occur in 25 % of ADHD cases. Oppositional Defiant Disorder (ODD) is seen in 40 % to 60 % of children with ADHD and 20 % to 30 % develop Conduct Disorder (CD) (Barkley, 1990). Since there are no specific tests for ADHD, data needs to be collected and synthesized from a variety of sources. This includes a medical evaluation and history, rating scales by parents, teachers, significant others and self-reports, psychometric techniques, and where possible direct observation by those skilled in diagnosing ADHD (Kelly & Aylward, 1992).

Education

Education provides a greater understanding of ADHD and how it affects ones life. It helps dispel the myths such as taking medication leads to drug addiction in later life

(Fowler, 1992). Studies have not shown that alcoholism or drug addiction are an outcome of drug treatment for ADHD (Wilens, 1996). The greater the understanding the more likely one is able to avoid the blaming and the guilt (Hallowell & Ratey, 1995; Kelly & Ramundo, 1993). Support groups such as the Children and Adults with Attention Deficit Disorders organization and the Saskatchewan branch of CHADD provide literature and speakers on ADHD for their members and generally promote public awareness.

Structuring

Besides gaining knowledge about ADHD through education, structuring through behaviourial training and the adoption of some simple organizational tools have been effective. Behavioral training used by teachers and parents includes changing tasks, situations, directions or people (Landrum, AL-Mateen, Ellis, Singh & Ricketts, 1993). Parent training in behavioral management techniques and parent support groups have been important to maintaining healthy family relationships by providing new techniques for providing limits (Fowler, 1992; Wells, 1993). Simple tools such as lists, reminders, appointment books and simple filing systems are concrete ways to provide structure to reduce the chaos for people with ADHD (Hallowell & Ratey, 1995).

Coaching and/or Psychotherapy

Individual, group and family counselling have been helpful to deal with the fallout from ADHD that may be seen in poor self-esteem and poor self-image (Hallowell & Ratey, 1995; Weiss, 1992). Adolescents and adults with ADHD are at risk for behavioural and emotional difficulties (Richard-McDonald, 1992). This includes substance abuse since there is a tendency for people with undiagnosed ADHD to self-

medicate to achieve relief (Barkley, 1990; Hallowell & Ratey, 1995). Also there appears to be a close correlation between antisocial behaviour and substance abuse with continuing ADHD symptoms. Financial management can be a problem (Weiss, 1992) as can employment. Generally, the Canadian children with ADHD that Weiss and Hechtman (1993) had followed into adulthood were employed and economically self-sufficient; however, they earned less, held jobs for shorter periods and received poorer work performance ratings. Finally, legal problems can be a difficulty. Weiss and Hechtman (1993) found that 20 % of people with ADHD engage in anti-social behaviour such as physical violence and weapon possession. They also have higher than expected traffic violations (speeding) and accidents (Barkley, 1997). To address these behavioural and emotional difficulties Wender (1987) feels that the therapist must focus on the bad psychological habits that have come from trying to deal with the ADHD. Weiss (1992) uses a technique of visualization as a form of cognitive desensitization by imagining painful past events and re-writing the script in a different way. Cognitive/behavioural therapies, which work at identifying distorted thinking and changing one's behavioural responses, have proven to be the most effective (Wilens, 1996).

Medication

Of the five components of treatment, medication is the most divisive and the most controversial (Mahoney, 1994). The division is most strongly reflected in the philosophical approaches between those who treat ADHD and those who treat substance abuse. In treating ADHD medication is recognized as beneficial, but substance abuse treatment centres advocate chemical free approaches (Nadeau, 1995). The controversy over the use of medication to treat ADHD is often captured in the media with headlines

such as "A pill before lunch at Camp Ritalin" (Campbell, 1997) or "Social issues at the root of child disorder" (Gilksman, 1997). Campbell in the Globe and Mail cited the dramatic rise in Ritalin use in Canada and how some critics say it flattens the personality of some children. The Australian article by Gilksman compared the spread of ADHD among children to an epidemic, and he warns us about using dangerous medication to solve what he calls DDD (Dad Deficiency Disorder). In addition, doctors are concerned that the medication they prescribe will be sold on the streets.

Spencer (1996) and Wilens (1996) reassured us that there is no basis for the state of alarm regarding ADHD medication. Spencer (1996) points out that we have over 50 years of experience and testing to guide medical practitioners, since ADHD has been 'the' most studied childhood disorder. Wilens' (1996) research waylays concerns over addiction to ADHD medication, especially the stimulants. He points out that marijuana is the major drug of choice by substance abusers.

The most commonly used drugs to treat ADHD are the stimulants. Pelham (1986) pointed to three, documented classroom behaviours that show the effects of stimulants. This includes improvement of on task behaviour, more compliant behaviour and increased amount of work completed. Methylphenidate (Ritalin) accounts for 90 % of stimulant use according to DuPaul and Barkley (1990). The minimal side effects that may occur include insomnia, decreased appetite, stomachaches and headaches (Barkley, 1981). Dextroamphetamine (Dexedrine) which was the first drug used and more recently pemoline (Cylert) which may have a higher risk of liver problems and has a longer duration than methylphenidate (Mahoney, 1994), complete the stimulants of choice. Although stimulants produce short-term effects, the effects of the psycho-stimulants are

time limited. There is no evidence to suggest long-term prognosis is improved by the use of stimulants (Weiss & Hechtman, 1993). Wender (1987) has found that usually medication is required for adults to achieve satisfactory treatment.

Other medication used in exceptional cases include the tricyclic antidepressants primarily imipramine (Tofranil) and desipramine (Norpramin) which are used when anxiety or depression are present, when stimulants are not working, or there is a history of substance abuse or tics (Sood, Wood, Ellis, Burns & Singh, 1993). The benefit of the antidepressants is that they are longer lasting. Their side effects include irritability, drowsiness, dry mouth, and cardiovascular effects (Kelly & Aylward, 1992). Clonidine, an antihypertensive agent, is very effective for children who are severely overactive and aggressive and/or who have Tourette's syndrome. Drowsiness is a side effect of Clonidine (Sood et al., 1993).

There are many controversial treatments for ADHD. According to Goldstein and Ingersoll (1992) these include dietary intervention such as Feingold's avoidance of artificial food colouring and preservatives, megavitamins and mineral supplements, anti-motion sickness medication, and candida yeast which is based on the belief that toxins produced by yeast overgrowth are responsible for weakening the immune system. The research, according to Goldstein and Ingersoll (1992), does not support these treatments. Similarly, they say that expensive biofeedback technology has not been proven to be effective with ADHD.

Today, treatment for ADHD is generally accepted to include medication and psychosocial treatments (Weiss & Hechtman, 1993). Stimulants are the most widely used with methylphenidate being the most common (Mahoney, 1994; Weiss &

Hechtman, 1993). Psychosocial treatments include social skills training, behaviour modification, parent training, support groups, academic training and remediation and individual and group therapy (Weiss & Hechtman, 1993). Multimodal treatment has become the most widely supported approach to addressing ADHD (Fowler, 1992; Hallowell & Ratey, 1995; Mahoney, 1994; Weiss & Hechtman, 1993). Weiss & Hechtman (1993) stated that it is their "...clinical belief that adult patients with ADHD can be helped by medication, behavioral therapies, and psychoeducation." (p. 405). They go on to say that couples will likely need marital therapy and help with parenting and that a vocational assessment and guidance may be needed for the adult with ADHD. In looking at prediction of outcome for ADHD children, Weiss and Hechtman (1993) reported that studies have shown that adolescent aggression has predicted antisocial behaviour in adults. Other important predictors according to studies were intelligence, socioeconomic status and family functioning. The higher the intelligence and socioeconomic status plus a healthy family seem to lead to more positive outcomes for ADHD people. Adults with ADHD felt that the most influential thing that helped them was a significant person such as a parent, a teacher, a counsellor or a friend (Atkins, 1996). Because of the risk of adult psychopathology, Weiss and Hetchman (1993) called for early diagnosis and treatment for children.

How does ADHD Affect Learning?

The impact of ADHD on learning can be very significant. Inattention, hyperactivity, and impulsivity lead to very poor organizational skills and trouble sustaining attention on tasks that require routine and repetition. Often this is coupled with deficits in visual and auditory processing and sequencing and results in

underachievement at school with many ADHD children failing at least one grade by adolescence and over one third failing to complete high school. (Barkley, 1990; Weiss & Hechtman, 1993; Wender, 1987; Zentall, 1993). Poor performance leads to criticism which may result in a poor self-image and resistance to social demands (Wender, 1987). By the time people with ADHD reach adulthood they may have many emotional scars and they may have developed many maladaptive behaviours. In order to support them in their return to school, Javorsky and Gussin (1994) recommended a proactive approach that provides services and accommodations. They feel a post-secondary program for ADHD adults should include the following components: a) disability documentation standards and screening procedures, b) provision of services and programs, and c) instructional and testing practices and accommodations.

Implications of ADHD for ABE Delivery

The SIAST Education Equity Program begun in 1989 is designed to increase enrolment and graduation rates in designated groups (Wascana Institute, 1994). The groups are those which have been identified by the Saskatchewan Human Rights Commission and include: members of visible minorities, people of Aboriginal ancestry, people with disabilities; and women in predominantly male programs. In June, 1995, ABE was included as part of SIAST's Equity program. Students with ADHD and substance use disorders are included as people with disabilities. SIAST has developed documentation standards, and the Intake/Assessment program at Wascana Campus has begun screening procedures.

I was hired in September, 1995, to lead the development of a comprehensive assessment module for adult students returning to complete their Adult 10 certificate. It

was believed that earlier identification of learning difficulties and strengths could lead to greater success. The model that was developed built on the historical success of the existing Intake program at Wascana Campus and added components from similar programs at Kelsey Campus and Palliser Campus. Psycho-educational measures were incorporated. (See Appendix A for a description of the tests.) In developing the norm-referenced testing battery that I give to the group over two days, I drew on the experience of the educational psychologists at SIAST, and I reviewed my battery of tests with Dr. Bessai and Dr. Miller at the University of Regina. In addition, the classroom instructors received training in observing for ADHD symptoms in the classroom. Hopefully, these steps to better screening will provide a more proactive approach to identifying potential learning difficulties at the beginning of the ABE student's program and ensure greater success.

In looking at the provision of services and programs, Burcham, Carlson, and Milich (1993) have noted the following characteristics of schools doing promising work with ADHD students. Effective programs include: 1) a systematic and comprehensive training program including an overview of ADHD, school-based assessment and intervention strategies that are usually behaviourally based; 2) full support by administration; 3) a team approach that involves school, family and community service; 4) the school has recognized ADHD as a discernible disorder. Models such as the programs at Curry College in Milton, Massachusetts and Adelphi University in Garden City, New York, for college students with learning disabilities would be useful models for ABE students with ADHD. They incorporate a one-month summer program prior to entry and ongoing support, especially during the student's first year. The students are

encouraged to develop self-awareness and self-advocacy (Barbaro, 1982).

Instructional and testing practices and accommodations need to reflect what we know about ADHD. First, consider the impact of attention deficit and impulsivity. People with ADHD find their attention is drawn by any strong stimulus such as colour and movement. When they face a task that is new, complex and unstructured, such as in reading comprehension and problem solving, selective attention is required. To master rote skills, such as math facts and spelling, sustained attention is needed. Both types of attention (selective and sustained attention) are problematic for people with ADHD and result in poor academic performance (Zentall, 1993). Similarly, impulsivity results in errors because the person fails to wait to consider alternatives or consequences. Zentall (1993) pointed out that failure to wait produces a) poor performance on multiple choice questions; b) poor planning skills; and c) failure to read directions or ask for help. This of course has implications for instruction.

To improve attention, Zentall (1993) reported that research has encouraged the use of colour, novelty, and psychostimulants. Selective attention is essential for comprehension and following directions. Highlighting key points and words with colour will aid comprehension. Visual cues such as diagrams and charts will help with following directions. Similarly, introducing colour later for rote practice such as in spelling will increase sustained attention. Novel settings have been reported to improve behaviour. Music novelty has improved math productivity. Psychostimulants have helped with math facts and handwriting. Waiting becomes easier when verbal and motor activity are allowed (Zentall, 1993).

Programming for students with ADHD needs an emphasis on study strategies and

time management (Hallowell & Ratey, 1995; Javorsky & Gussin, 1994). Zager and Bowers (1983) found that morning classes led to better academic and behavioral performance for students with ADHD. Instructors who are active and novel in their presentation of information contribute to better performance for students with ADHD (Zentall & Kruczek, 1988), and lecture-based classes which provide little opportunity for discussion result in poor performance for students with ADHD (Zentall, 1991).

Much that has been learned about the accommodations for the learning disabled adult will apply to the adult student with ADHD (Javorsky & Gussin, 1994). Vogel (1993) has compiled an excellent handbook for the learning disabled college student. Hallowell and Ratey (1995) provide 50 tips on classroom management and the CHADD Educator's Manual is essential (see Appendix B: Tips for Helping Students with ADHD).

People with ADHD have incredible energy and enthusiasm. Positive aspects that adults with ADHD shared with Atkins (1996) in his exploratory study of the experience of ADHD in adulthood included: increased empathy for others who are struggling, spontaneity and creativity. According to Hallowell and Ratey (1995), this intuitive creativity may be attributed to their tolerance for living with chaos combined with their ability to move quickly from one thought to the next. Making sense out of chaos and making connections that others do not see seems to be part of the creative process. Their divergent thinking is a base for originality and entrepreneurship (Kelly & Aylward, 1992). The ability to hyperfocus, or intently focus, has allowed some people with ADHD to excel in specific arenas such as sports or art (Murphy & LeVert , 1995). They also have been reported to have more fun (Barkley, 1992). When this energy and creativity can be focused a lot can be accomplished. Changes are more likely to occur when this

involves a multimodal approach that includes an accurate diagnosis, education, structuring, coaching and psychotherapy and medication (Hallowell & Ratey, 1995). For educators who are responding to the needs of their students with ADHD it is important to remember that "...in the large majority of cases, administrative, instructional and management changes that are beneficial for students with ADHD are beneficial for everyone"(Reeve & Welch, 1993).

Chapter 3: Method

Participants

Three hundred and fifty-five adult students were assessed through the Intake/Assessment program in Adult Basic Education at Wascana Campus during two academic years, 1996-1997 and 1997-1998. Wascana Campus is one of four campuses of the Saskatchewan Institute of Applied Science and Technology. Wascana Campus is located in Regina, a small city of 180,000, which is the capital of the prairie province of Saskatchewan, Canada. Students spend around five weeks in the Intake/Assessment program before proceeding to the Adult 10 program or the Transition to Work program.

The 1996-97 Wascana ABE annual report (SIAST, 1998) statistics report that in the Adult 10 program 56 % of students were female, 48 % were Aboriginal, 15 % self-identified as having a disability, and 65 % were 30 years of age and under. The Transition to Work program's demographics were 55 % female, 38 % Aboriginal, 9 % self-identified with a learning disability and 63 % were 30 years of age and under. Generally, all these students would have come through the Intake/Assessment program.

Of the 355 students who participated in this study, 267 authorized the use of their test results for research purposes. Amongst the 267 students whose data were used in this study, gender, age and equity classification were as follows. Slightly more than half (55.8 %) the participants were female (149), and 44.2 % were male (118). The mean age of the group was 28.6 years with a range from 17 to 55 years. The participants break into three relatively equal groupings: 35.8 % were 17 - 24 years old, 30.5 % were 25 - 30 years old, and 33.7 % were over 30 years old.

"(Equity in education) is not a concept that produces the same results for everyone. It is a concept that seeks to identify and remove, barrier by barrier, discriminatory disadvantages. (Equity in education) is access to the fullest opportunity to exercise individual potential" (Abella, 1984, p. 3). The SIAST Education Equity Program was initiated in 1989 to increase enrollment and graduation rates of four specific groups: people of Aboriginal ancestry, members of visible minorities, people with disabilities and women in predominantly male programs. The Saskatchewan Human Rights Commission determines equity classifications. SIAST is believed to be the first post-secondary institution in Canada to adopt a comprehensive Education Equity Policy for its students (Personal communication, Bill Coulthard, Program Head, Student Services at SIAST Wascana Campus, August 5, 1998). Formal integration of ABE students into the Education Equity Program was approved by the SIAST Management Team on June 15, 1995 (Stonehouse, 1995).

One hundred and fifty-four of the study participants (57.7 %) self-identified under the Education Equity Program. The Aboriginal category includes Status Indians (Indians with Treaty rights); Metis (People who are descendants of Indian and European parentage); and NonStatus Indians (Indians without treaty rights). In this study, Aboriginal people represented 41.9 percent of the participants. Visible minorities, other than Aboriginal people, were 3.0 percent. The participants who self-identified as having ADHD represented 5.6 percent of this ABE sample. ADHD is generally included under the disabled category, but for this study it was tallied separately. Persons with Disabilities, other than ADHD, were 7.1 percent of the 267 people in the ABE sample. This included persons with a variety of disabilities - motor, vision, hearing, mental,

communication-related and other short and long-term disabilities. The remaining students (42.3 %) did not self-identify under any of the Equity categories. This may mean that they do not qualify under the Education Equity Program or that they chose not to self-identify. The onus is on the individual to self-identify, usually prior to beginning classes at SIAST, and to provide the necessary documentation. Qualifying under the Education Equity Program may entitle individuals to accommodations in the classroom such as extended time on tests or tutoring support where documentation warrants and funds allow.

Ethical Considerations

Confidentiality, Consent and Approvals

Confidentiality and consent are vital to my work as the Intake/Assessment Instructor in the Adult Basic Education programs at Wascana Campus. They are also vital in my role of researcher. Very personal, sensitive information is elicited by some of the tests such as the Substance Abuse Subtle Screening Inventory and the ADHD Check Lists. I wanted to ensure two things: 1) Students knew that they had a choice in doing the tests and 2) Students would control to whom I could release test information. To guide me, I went to see Dr. Kuhns, who was teaching the ethics class, at the University of Regina. He helped me to develop my Permission to Administer Form and the Release of Information Form (see Appendix A). He also advised me on a process to follow. I also received ethics approval from the University of Regina Faculty of Graduate Studies and Research (see Appendix C).

Students are told upon entering the Intake/Assessment program that this is an assessment process that is done with the student and that they will have control over who

gets to see their test results. At least one day prior to testing, I take 45 minutes to explain each test and its purpose by elaborating on the brief Description of the Tests (see Appendix A) that is given to each student. I take care to give examples of students declining to take particular tests and of students choosing to have me destroy their results. Students are encouraged to do the tests to get the information that the tests can offer, but are clearly informed that they have the right to decline without penalty. They are specifically told that test information such as that on Substance Abuse or ADHD is not being used to screen students out of the program, but rather it is used to invite students to look at areas of their life that might impede their success. It is emphasized that the Permission to Administer Form is only an agreement to take the test and have me give them their results. There is ample opportunity for students to ask questions.

After students have received their results and had time to discuss them with me, usually four weeks later, they are asked to sign the Release of Information Form. This allows me to pass on information to their next instructor or counsellor and allows Wascana Campus to use their test results, without identifying them, for research purposes. Again students are invited to add any restrictions that they feel are necessary. I give examples of past students who do not want their Substance Use test results shared or who do not wish to be involved in research, so they indicate that restriction on the release form. From a pure research point of view, I recognize that I have introduced bias by following this process, since it is not uncommon for students to leave the program prior to completing the release of information. Consequently, I am not able to use the test data I have on 88 people. Many might argue that these people were at greater risk for problems such as substance abuse or ADHD. I am more concerned that students are in

control of their test information. They know that their files are open to them. Before they sign their release of information, they have had an opportunity to get to know me better and to understand the purpose of the program.

We believe that research can help to inform our practice at Wascana Campus, so my supervisors are eager to see if the Intake/Assessment tools are predictive and if they are helpful in identifying students' strengths and weaknesses. Because we want to use the whole battery of test results, I did not identify my specific topic of research. However, all my students knew that I intended to use their test results, without identifying them, to investigate the relationship of ADHD and Substance Use Disorders, and I would put a copy of my completed report in the ABE Library at 8th Ave. N.

From the outset I was supervised by Pat Hoffman, who has her Masters in Educational Psychology. She was very supportive of my work and eager for me to do some research related to the testing in the Intake/Assessment program. The Wascana Campus Director was also supportive of my research (see Appendix C).

Cultural and Educational Background Sensitivity

In selecting testing tools, I very consciously chose tools that were less dependent on literacy skills and understanding English. Many of my students have very low literacy levels (as discussed in Chapter One) and some have low levels of English fluency. Wherever possible, without jeopardizing test validity, directions are given orally and demonstrated. Test items are frequently read and questions of vocabulary are answered. The goal was to choose tests that did not put students at a disadvantage because of educational background or culture, recognizing that no test is culture free.

Chrisjohn, Pace, Young, and Mrochuk (Chrisjohn & Young, 1997) issued a stinging

condemnation of psychological assessment of First Nations People at the Canadian Psychological Association Conference held in Ottawa in 1990. In their paper entitled Psychological Assessment and First Nations: Ethics, Theory and Practice, they present compelling arguments based on the present code of ethics adopted by the American Educational Research Association, American Psychological Association and the National Council on Measurement in Education called the Standards for Educational and Psychological Testing. Basically, they argue that testing of First Nations people violates the standards of ethical procedure which require tests to be normed on the population that is being tested before any inferences can be made. They challenge the practice of developing supplementary norms of First Nations peoples for specific tests and the practice of including First Nations peoples in the construction sample of a test because the sample size used is very small. Therefore, they argued, one cannot generalize results to the larger group of First Nations people. In addition, they see a lack of appreciation of the cultural and linguistic differences of the over 600 First Nations cultures in North America. "To sum up: current test usage with First Nations peoples is in clear violation of the ethical requirements to compare individuals with an appropriate norm. Schemes that have been developed to address this issue fail to deal with it conceptually, technically, and practically.... **WE EXPECT THEM TO STOP TESTING US"** (Chrisjohn & Young, 1997, p.212).

With this resounding damnation of testing of First Nations peoples ringing in my ears, I proceeded with trepidation. On the advice of Dr. Miller (Personal communication, February 4, 1998), Research Director of the SASSI Institute, I chose to re-score all the substance abuse tests, the SASSI-2, using a conversion mask to the newly revised SASSI-

3 norms because the SASSI-3 (See below) was normed on a larger Aboriginal population.

Instruments

The adult students with ADHD in this study are those who are screened at risk for ADHD based on both the Wender Utah Rating Scale and the Conners' Continuous Performance Test. The Wender Utah Rating Scale screens for the presence of ADHD symptoms in childhood and the Connors Continuous Performance Test screens for the persistence of ADHD symptoms into the present. Research by Roy-Bryne, Scheele, Brinkley, Ward, Wiatrak, Russo, Townes, and Varley (1997) found that the Wender Utah Rating Scale and the Connors' Continuous Performance Test helped with diagnosing adult patients for ADHD. Those with ADHD had higher scores on the Wender Utah Rating Scale and poorer scores on the Connors' Continuous Performance Test. Their findings suggest that these tools are helpful in clarifying the diagnosis of adults with or without ADHD and would also be very useful as screening tools.

Wender Utah Rating Scale

In order for an adult to be diagnosed with ADHD the condition must first be shown to have existed in the individual's childhood. According to Wender (1995), the Wender Utah Rating Scale (WURS) was developed to assist with retroactively diagnosing individuals whose parents were not available. Under the premise of 'As a child I was (or had)', sixty-one ADHD behaviours (see Appendix D for WURS sample) are rated on a continuum scale. The rating scale is scored as follows: Not at all or very slightly = 0; Mildly = 1; Moderately = 2; Quite a bit = 3; Very much = 4. The population for developing the test norms included: ADHD Adults N = 81; Normal Comparison Subjects N = 100; and Depressed Comparison Subjects N = 70.

Validity. Ward, Wender and Reimherr (1993) chose 25 items for their calculations out of the original 61 items because these showed the greatest difference between their three groups. A cutoff score of 36 or higher on the 25 items would correctly identify 96 % of adults with ADHD and 96 % of the normal group, but this score was not as discriminating for the depressed group. A cutoff score of 46 or higher correctly identified 86 % of the ADHD adults, 99 % of the normal group and 81 % of the depressed outpatients, so this is what they recommend. Rossini & O'Connor (1995) found that the original recommended cutoff score of 46 resulted in higher false positives in their college population. Roy-Bryne et al (1997) found that ADHD patients had significantly higher WURS scores than their non-ADHD group. They also found that the 46 cutoff score identified 33 out of 46 ADHD patients (71.7 %), but only 28 of 46 non-ADHD (60.9 %) and 20 out of 46 possible ADHD (39.2 %) were identified as not having ADHD. This led them to conclude that, "...the WURS was sensitive to ADHD symptoms but not specific for it, with high scores occurring in 40 % to 60 % of patients without ADHD" (p.137).

Pearson correlation coefficients were calculated between the WURS and the Parents' Rating Scale used in the original sample. For normal subjects $r = 0.49$ and for ADHD subjects $r = 0.41$. "Although the correlations obtained were moderate, the fact that they were obtained with two entirely different instruments filled out independently by two different individuals describing childhood behavior 25 or so years earlier makes these correlations more impressive" (Ward, Wender, Reimherr, 1993, p.886). Another test of validity by the test constructors was to see if the WURS would predict treatment outcome for 37 patients by using a placebo-controlled study of methylphenidate. They discovered

that those who responded to methylphenidate had higher WURS scores than nonresponders (Responders to methylphenidate mean WURS score of 70.3 (SD=12.5) and nonresponders mean WURS score of 59.7 (SD=15.6) with $t=2.13$, $df=36$, $p<0.025$, one-tailed).

Reliability. Comprehensive reliability of the Wender Utah Rating Scale has demonstrated excellent internal consistency (Cronbach alpha = .89), significant temporal consistency (test-retest reliability r = .81) and good temporal stability (Shrout & Fleiss intraclass correlation coefficient ICC = .68) (Rossini & O'Connor, 1995; Stein, Sandoval, Szumowski, Roizen, Reinecke, Blondis & Klein, 1995). Split-half reliability coefficients of odd/even items resulted in r = 0.90 (Ward, Wender, Reimherr, 1993).

Limitations. The WURS is totally based on the informant's view of his/her childhood behaviour and so it is subject to self-report and retrospective bias (Stein et al., 1995). This could be addressed by using corroborators. Secondly, Stein et al. (1995) point to the lack of any age-reference points, so people are being asked to summarize their childhood, a time of dramatic change. In addition, the emphasis of the WURS on hyperactivity may miss the subtype (ADHD, Predominantly Inattentive Type) without hyperactivity (Brown, 1995). Finally, there is the concern of reading comprehension for a population that we know has literacy problems.

Advantages. Rating scales such as the WURS have the advantage of being not as costly and not as time consuming as other forms of assessment, especially for screening purposes (Edelbrock, 1983; Stein et al., 1995).

Conners' Continuous Performance Test

Conners' Continuous Performance Test is a 14-minute vigilance test that is presented in a game-like format on the computer. Letters are presented one at a time at varying speeds on the screen. The testee is to respond as quickly as he notices a letter either by hitting the spacebar or the left mouse button. In this version of the test the testee is not to hit the spacebar for the letter X. A computer printout analyzes the number of correct responses to the stimuli and the reaction time (see Appendix E for a sample printout of the Connors' CPT).

Validity & Reliability. Conners' test is based on widely researched models of Continuous Performance Testing (CPT) that show this to be a valid, reliable approach for assessing attention (Conners, 1995, Roy-Bryne et al., 1997). Sergeant and Van Der Meere (1991) in their review of the literature on the CPT found consistent reports from several studies that hyperactive children made more errors than the control group on the CPT. Studies of medication treatments have used the CPT. These tests showed improved accuracy on the CPT indicting improvement in attention while on medication (Barrickman, Perry, Allen, Kuperman, Arndt, Herrmann & Schumacher, 1995; Pelham & Milich, 1991). Halperin, Newcorn and Sharma (1991) have done extensive research using the CPT. They indicate that "the CPT can be used to delineate symptoms of inattention and impulsivity in children, which can then be used as a means of syndrome definition and, potentially, as a means of assessing the differential effects of various treatment interventions in distinct diagnostic groups" (p. 21). Barkley (1990) recommended the CPT as a useful component in evaluation because it provides objective data with standardized administration, reliable results, and normative data. Fisher,

Newby & Gordon (1995) found that CPTs could help to identify "clinically meaningful differences" amongst ADHD children. For example, they found that ADHD children who scored normal on the CPT had a 50 % reduced probability of having a positive response to stimulant medication. This they felt may help to explain the concern of false negatives on the CPT.

For the Connors' Continuous Performance Test, general population norms were established on 520 cases. Conners (1995) states that, "...it seems conservative to say that false positives and false negatives for the CPT are 10-15 % or lower" (p. 68). In interpretation, Conners cautions users to rely on the overall narrative interpretation and to use the CPT not as a definitive measure but as one objective part of an assessment of attention.

Limitations. Although CPTs were originally believed to measure attention and impulsivity, there has been research that suggests that the CPT is measuring arousal and information processing and planning (Campbell, D'Amato, Raggio & Stephens, 1991). Campbell et al. (1991) found that their CPT results were more closely related to academic achievement, and so this raises the question of what exactly the CPT is measuring. Children over 12 also tended to have more normal scores than younger children unless the CPT task was extended in time from 9 minutes to 12 minutes (Fischer, Newby & Gordon, 1995).

Advantages. Computerized CPTs are an efficient, objective measure that is able to rapidly calculate complex data, and CPTs seem to be able to find 'clinically meaningful differences' between those with ADHD and those without (Campbell et al., 1991; Fischer, Newby & Gordon, 1995).

Substance Abuse Subtle Screening Inventory

The adults in this study have been screened with the Substance Abuse Subtle Screening Inventory (SASSI-2 and re-scored using the SASSI-3 norms) to determine if they are at risk for chemical dependence. "The SASSI's primary purpose is to serve as an objective screening tool to differentiate substance abusers from non-abusers" (Miller, 1985, p. 5-3). There is no attempt to distinguish between substance abuse and substance dependence.

Description of the Test. The SASSI-2 is a two-sided paper and pencil questionnaire. On one side are 62 questions apparently unrelated to alcohol and drugs, each requiring a true or false response. The flip side of the SASSI-2 asks the respondent to describe the frequency of their life experience to 12 situations involving alcohol and 14 situations involving other drugs. The reading level is claimed to be around the fifth grade level, and it can be administered orally or there is a tape. It takes ten to 15 minutes to complete the SASSI-2 and a minute to score. The scores are broken into eight subscales, which are converted to T-scores. A variety of decision rules are applied to determine either the classification of chemical dependent or nondependent. The items on the SASSI-2 were empirically chosen. The SASSI-2 is appropriate for adults 18 and older and claims to be independent of age, education and socioeconomic status.

History of SASSI. The original SASSI was published in 1985 (Miller, 1985). It was followed by the Adolescent SASSI (ages 12-18) in 1990 which modified the adult item pool through rewriting and simplifying and making the items more relevant to their intended audience. The Adult SASSI-2 replaced the Adult SASSI in July, 1994. This in turn has been replaced by the SASSI-3 in June, 1997 (Miller, 1998) which retained the

same items, but developed new scales and enlarged the normative population. A conversion kit allows you to rescore the SASSI-2 to the SASSI-3.

Sample for the SASSI-3. Miller (1998) states that the sample is based on 2,646 respondents. The majority of respondents (74 %) were drawn from treatment centres across the United States. A small percentage of respondents (2 %) were incarcerated and the remainder (24 %) were from non-treatment centres such as colleges. Sixty-two percent were male. The sample included the following racial groups: 59 % Caucasian, 22 % African-American, and 11 % Native American. The average age of the sample was 32 and the average educational level was Grade 12.

Reliability. The alpha coefficient which is a statistic based on the average correlation among items and the number of items used to measure internal consistency of a uni-dimensional measure, was .94. The test-retest coefficients obtained from administrations one to two weeks apart to 40 respondents ranged from .92 to 1.00 (Miller, 1998).

Validity. SASSI-3 results were compared to the diagnoses of clinicians. SASSI-3 had a correspondence rate or an accuracy rate that matched the clinicians' diagnoses 93.8 % of the time. The sensitivity rate of the SASSI-3 to identify people with a diagnosed substance-related disorder was 94.1 %. The specificity rate of the SASSI-3 to identify people who had been diagnosed as not having a substance-related disorder was 92.7 % (Miller, 1998).

Construct validity was demonstrated by associating the SASSI-3 to other criteria. The SASSI-3 was found to be associated with substance-related arrests and the number of illicit drugs used. The SASSI-3 was disassociated with unrelated criteria such as

intelligence, reading and arithmetic tests (Miller, 1998).

Subscales of the SASSI-2 and SASSI-3. The subscales of the SASSI-3 (Miller, 1985, 1998) are as follows:

1. Obvious Attributes Scale (OAT) measures the client's openness to symptoms or problems related to substance abuse. High scores can be interpreted as a similarity in personal style to those who are chemical abusers.

2. Subtle Attributes Scale (SAT) measures the client's predisposition to chemical dependence. It is very resistant to faking. Children of alcoholics tend to have higher SAT scores.

3. Defensiveness Scale (DEF) measures the client's defensiveness to test taking. High scores are associated with denial, resistance to change and negative feedback. Low scores often reflect a sense of worthlessness, depression, and a resistance to positive feedback.

4. Supplemental Addiction Measure Scale (SAM) is used in conjunction with the DEF. It is only used in the decision rules to identify defensive clients with elevated DEF scores as chemically dependent.

5. Family vs. Controls Scale (FAM) is used to measure codependency. High scores suggest a similarity between the client and family members of chemical abusers. It is not used as part of the decision rules for chemical dependence.

6. A Correctional (COR) Scale was added " to predict risk of repeated contact with criminal justice systems" (p. S-3). It is not used in the decision making to determine chemical dependence.

7. A Random Answering Pattern (RAP) Scale, previously used on the Adolescent

SASSI, was incorporated into the Adult SASSI-2 to identify clients "...who have responded to the assessment in a non-meaningful manner" (p. S-3). Rap scores of 2 or more suggest the results should be interpreted cautiously, or treated as invalid.

8. Symptoms (SYM) Scale is a new scale on the SASSI-3 which looks at the causes and consequences of substance misuse. It measures the extent that the respondent is acknowledging specific problems associated with substance misuse.

9. The Face Valid Alcohol Scale (FVA) and the Face Valid Other Drug Scale (FVOD) are the second part of the SASSI. These scales are based on Linda Morton-Wakefield's Risk Prediction Scales developed in 1978.

Miller (1985) believed,

> The accuracy of the SASSI, especially when combined with the Risk Prediction Scales, is high in identifying abusers who are in the middle or late stages of the progression of the disorder. The incremental validity of the SASSI, in combination with other measures of addiction, is particularly important in identifying early stage abusers or abusers who are either in denial or deliberately trying to conceal their abuse pattern. The SASSI's resistance to efforts at faking may well be its most valuable attribute (p. 5-15).

The combination of the SASSI and the Face Valid Scales were the most effective in identifying chemical dependence. Miller's research (1985) found that the combination identified 90 % of the residential detoxification sample, 80 % of early stage abusers in an outpatient program and 90 % of nonabusers.

The SASSI has high concurrent validity (.87) with the MacAndrew subscale of the Minnesota Multiphasic Personality Inventory (Miller, 1985).

Reviews of the SASSI. Reviews of the SASSI-2 are mixed. Kerr (1994) concluded, "The SASSI is almost as good as its promotion claims it to be. It seems to have been responsibly developed, and it is clearly created with the practitioner in mind.

...The SASSI fits its population as well; it does seem to accurately identify those who are denying or obscuring their substance abuse, particularly among less advanced stage abusers" (p.1018). Risberg, Stevens and Graybill (1995) found the classification accuracy of the SASSI to be significant and their results provided further validation of the SASSI scales which supported the usefulness of the SASSI for screening. Vacc (1994) was impressed by the low cost, the ease of use by testers and the short testing time.

On the other hand, Svanum and McGrew (1995) challenge the use of the SASSI. In their university population the SASSI only identified one-third of the substance dependent people and inaccurately identified others. They question the content validity of a subtle assessment and advocate the use of direct assessments.

Data Collection and Analysis

Data Collection Procedures

A new group of 20 to 30 ABE students begin the Intake/Assessment class about every five weeks over a ten-month school year. The purpose of the Intake/Assessment class is to orient students returning to school by starting them in the academic subjects of reading, writing, spelling, and mathematics and introducing them to computer keyboarding. Monitoring attendance and classroom behaviour identifies the student's readiness for school. Students write a battery of standardized tests that examine achievement, educative ability, aptitudes, self-esteem, personality, vigilance and the potential for chemical dependence. They also complete a dynamic assessment that focuses on visual memory and organization to see what it takes for the students to learn a new task. Other screening tools are used to help screen for ADHD. (See Appendix A for a description of the instruments used in the Intake/Assessment program. Appendix D has

a copy of the Wender Utah Rating Scale and Appendix E has the Connors' Continuous Performance Test. The SASSI-3 was not included because of copyright restrictions.) All students had a one-hour, semi-structured interview with the Intake/Assessment instructor, who was also the researcher. The interview allowed me to gather background information and it provides the opportunity for the student to share their understanding of what they need to successfully complete their goals. This was also the time for the private sharing of test results from the battery of standardized tests that were administered earlier. We discussed what the test results were suggesting and explored if these results fit with the student's perspective and mine based on the work in the classroom. Strategies for learning and action plans, such as referrals to the counsellor, were established.

Data Analysis

A descriptive analysis is provided based on demographic information that identifies age, gender, and equity groups calculated in percentages to provide a frequency description of the ABE student population in the study. This is compared to other sources that describe the ABE student population. Frequency distributions were also calculated on the results of the three tests that were administered. These frequencies in the ABE student population were compared to those that were reported in the literature such as the rates of ADHD or Substance Use Disorder in the general population.

In exploring present attention problems, all analyses of the test results used the three overall categories identified by the Connors' Continuous Performance Test: Strong evidence for Attention Difficulties, Further Observations for Attention Difficulties, or No Attention Difficulties. The Substance Abuse Subtle Screening Inventory analysis used its two identified categories: High probability of substance use disorder and Low probability

of substance use disorder. The Connors' CPT categories and the SASSI categories were matched with the scores from the Wender Utah Rating Scale's retrospective assessment of childhood attention problems. Comparison of categorical variables was done using cross tabulations and the Chi-square statistical test to determine if the variables were statistically independent of one another.

To investigate the relationship between ADHD and PSUD the Pearson correlation coefficient was calculated for several combinations. The WURS and the SASSI-3 were correlated to see if there was a relationship between childhood ADHD and later substance abuse. The CPT and the SASSI-3 were compared to investigate the relationship between present attention problems and the risk of substance abuse. The WURS and CPT were compared to see if childhood attention issues had persisted to adulthood and would therefore be suggestive of current ADHD. Finally, the WURS and the CPT, representing current ADHD symptoms, were compared with the SASSI-3 to suggest that ADHD is a risk factor for substance use disorders. An analysis of variance compared the means of the groups and their statistical significance. The Statistical Package for the Social Sciences (SPSS, 1997) was used to complete the analyses.

Chapter 4: Findings of the Study

Description of Participants

Three hundred and fifty students were tested in the Intake/Assessment program at Wascana campus, SIAST during the academic years 1996-1997 and 1997-1998. Of this original sample, 267 students gave permission to use their test data for research purposes. This group of 267 was composed of 55.8 % female and 44.2 % male. The mean age was 28.71 years and ranged from 17 to 53 years. The research group of 267 included 112 Aboriginal peoples or 41.9 %, 8 visible minorities or 3 %, 19 disabled people or 7.1 %, and 15 people with ADHD for 5.6 %. This meant that 57.7 % qualified under the Education Equity program of SIAST. The remaining 113 people or 42.3 % were those who did not qualify or did not claim equity status. Not all students completed every test. The WURS was completed by 256 participants, the Connors' CPT by 223, and the SASSI-3 by 265.

ADHD Indicators

Wender Utah Rating Scale

The Wender Utah Rating Scale (WURS) is a diagnostic aid used to retrospectively assess adults for the presence and the severity of childhood ADHD. The 61-items ask questions about childhood symptoms for ADHD as well as related questions about behaviour and learning problems that are often associated with ADHD. Ward, Wender and Reimherr (1993) found that combining the scores from 25 items out of the original 61 differentiated between adults with ADHD and normal controls as well as outpatients with unipolar depression. Two cut off scores are reported. A score of 36 or higher, correctly classified 96 % of adults with ADHD and normal controls. By raising

the score to 46 or higher, 86 % of patients with ADHD, 99 % of normals, and 81 % of the depressed patients were correctly identified. The recommended cutoff score of 46 was suggested for clinical use (Ward et al., 1993). Statistics were compiled using a cutoff score of 36 and then using a cutoff score of 46. The results were as follows:

1. Using WURS with a cutoff score of 36 suggests that half the students had ADHD during childhood. WURS identified 127 out of 256 students or 49.61 % having scores greater than or equal to 36 with a mean score of 53.32 and a standard deviation of 13.77.
2. Fewer students were identified as having had childhood ADHD when WURS with a cutoff score of 46 was used. Eighty-one out of 256 students or 31.64 % had scores greater than or equal to 46 with a mean score of 60.15 and a standard deviation of 12 80. By gender the 81 students included 53 females (65.4 %) and 28 males (34.6 %). Of the self-identified equity students 46 or 29.87 % scored at or above 46 on the WURS. This represents 56.8 % of the 81 students with scores above the recommended cutoff. The study found no significant relationship among self-identification of equity status, age or gender and ADHD as indicated by a score of 46 or greater on the WURS.

Conners' Continuous Performance Test

The Conners' Continuous Performance Test (CPT) is a vigilance test that measures attention and impulsivity, through reaction times, omission errors (i.e., Failing to click on a letter before it goes by), and commission errors (i.e., Hitting the letter 'X' when one is supposed to let it go by), to determine a risk for attention problems. This objective measure can assist clinicians in the diagnosis of ADHD and measure the impact

of medication. Out of 223 students who completed the CPT, 89 or 39.9 % scored as having attention problems and 60 or 26.9 % were identified for further observation. Only 33.2 % of those tested scored as having no attention problems. By gender the 89 students identified as having attention problems included 64 females (71.9 %) and 25 males (28.1 %). Of the self-identified equity students 52 out of 127 or 40.94 % scored as having attention problems. This represents 58.42 % of the 89 students scoring as having attention problems. No significant relationship was found among self-identification of equity status, age or gender and attention problems as measured by the Connors' CPT.

WURS and CPT both indicating risk of ADHD

For ADHD to be diagnosed in adults, the DSM-IV (American Psychiatric Association, 1994) requires a presence of attention problems now, which is what the CPT measures, and a history of ADHD symptoms in childhood, which the WURS indicates. When the WURS cutoff was set at 46 or higher, 74 participants had taken the CPT. Of these, 38 students scored on the CPT as having attention problems, 19 were suggested for further observation, and 17 showed no attention problems. In other words, 38 students of the total study population of 267 or 14.23 % had attention problems as measured by both the WURS and the CPT. An additional 19 or 7.12 % scored above the WURS cutoff and were suggested for further observation by the CPT. A Pearson Chi-square of the 74 valid cases did not produce a significant relationship between the CPT and the WURS with a cutoff score of 46 or higher as shown in Table 4.1. This was a surprising result.

Table 4. 1

Pearson Chi-square Test of the Correlation Between the Connors' Continuous Performance Test (CPT) and the Wender Utah Rating Scale (WURS)

	Value	df	Significance
Pearson Chi-Square	59.884	54	0.271
Likelihood Ratio	67.034	54	0.110
Linear-by-linear Association	0.004	1	0.947
N of Valid Cases	74		

Substance Use Disorders Indicator

Substance Abuse Subtle Screening Inventory

The Substance Abuse Subtle Screening Inventory (SASSI-3) is a screening tool to identify those who seem to be at risk for Substance Use Disorders including either substance abuse or dependence. The SASSI-3 has an accuracy rate of 93.8 % with clinicians' diagnoses of Substance Use Disorders (Miller, 1998).

Two hundred and sixty-five students were invited to complete the SASSI-3. Of these 265 inventories 13 could not be used. Five students (1.9 %) declined to do the SASSI-3. Three students (1.1 %) requested that their results be destroyed after they received the test interpretation. Five results were considered invalid because the Random Answering Pattern (RAP) Scale was 2 or higher which suggests random answering or not understanding the questions, perhaps because of literacy problems. Of the useable 252 SASSI-3 inventories, a high probability of substance use disorders was identified in 130 ABE students (51.58 % of the useable inventories). One hundred and twenty-two

students were identified as having a low probability of substance use disorders (48.41 % of the useable inventories). Re-scoring the SASSI-2 with the conversion kit to SASSI-3 resulted in the following decision rule changes: 15 results changed their classification from nondependent to substance dependent and 11 results changed from substance dependent to nondependent classifications.

A cross-tabulation of age categories and the SASSI-3 indicated that out of the available 246 tests 50.81 % showed a high probability for Substance Use Disorders. Those with this high risk for addictions divided into the three age groupings as follows: 75 people (30.49 %) were 17 – 29; 48 people (19.51 %) were in the age range of 30 – 49; and 2 people (.81 %) were in the 50 + age range. A second cross-tabulation of high risk for addictions on the SASSI-3 with age categories that distributed the sample more equitably between categories gave the following results based on 241 people: 41 people (17.01 %) for age range 17-24; 33 people (13.69 %) for age range 25-30; 43 people (17.84 %) for age range 31–55+.

The SASSI-3 results were analyzed by equity groups for a high probability of substance use disorders. The risk for substance abuse by category was 9 out of 15 (60 %) self-identified ADHD students; 64 out of 111 (57.65 %) of Aboriginal students; and 0 out of 7 (0 %) of visible minorities. In total, 80 out of 152 equity students or 52.63 % appeared to have a high probability of substance use disorders. A Chi-square Test did not reveal any significant correlation between equity categories and Substance Abuse Disorders (See Table 4.2 for details).

Table 4. 2

Pearson Chi-square Test of the Correlation Between Equity Groups and the Substance Abuse Subtle Screening Inventory -- 3 (SASSI-3) Scores

	Value	df	Significance
Pearson Chi-Square	20.448	20	0.43
Likelihood Ratio	25.853	20	0.171
Linear-by-linear Association	0.39	1	0.53
N of Valid Cases	152		

ADHD Correlation with Substance Use Disorders

A WURS score of 46 or higher and a CPT rating of attention problems were used to screen for risk of ADHD in adulthood. Then these conditions were combined with the SASSI-3 results to look for a significant relationship between the conditions. Twenty cases out of the sample of 267 ABE students or 7.49 % satisfied the three conditions. A Pearson Correlation did show significance at the 0.05 level for the SASSI-3 and the WURS (See Table 4.3).

A WURS score of 36 or higher and a CPT rating of attention problems along with a SASSI-3 showing high probability for substance use disorder did not result in a significant correlation (See Table 4.4).

Table 4. 3

Pearson Correlation of the Wender Utah Rating Scale (WURS) Scores Higher than 45, the Connors' Continuous Performance Test (CPT), and the Substance Abuse Subtle Screening Inventory —3 (SASSI-3)

		WURS	CPT	SASSI-3
WURS	r	1.000	-0.008	-0.239
	N	81	74	81
	Sig.	.	0.948	0.032
CPT	r	-0.008	1.000	-0.064
	N	74	74	74
	Sig.	0.948	.	0.59
SASSI-3	r	-0.239	-0.064	1.000
	N	81	74	81
	Sig.	0.032	0.590	.

* Correlation significant at .05 level (2-tailed)

Table 4. 4

Pearson Correlation of the Wender Utah Rating Scale (WURS) Scores Higher than 35, the Connors' Continuous Performance Test (CPT) and the Substance Abuse Subtle Screening Inventory – 3 (SASSI-3)

		WURS	CPT	SASSI-3
WURS	r	1.000	-0.138	-0.105
	N	127	112	127
	Sig.	.	0.147	0.242
CPT	r	-0.138	1.000	0.011
	N	112	112	112
	Sig.	0.147	.	0.906
SASSI-3	r	-0.105	0.011	1.000
	N	127	112	127
	Sig.	0.242	0.906	.

When no WURS cutoff score was used there was a significant relationship between the WURS and the SASSI-3 at a significance level of $p < 0.01$ (see Table 4.5). There were no significant relationships based on age, gender or equity category.

Table 4. 5

Pearson Correlation of the Wender Utah Rating Scale (WURS) All Scores, the Connors' Continuous Performance Test (CPT) and the Substance Abuse Subtle Screening Inventory – 3 (SASSI-3)

		WURS	CPT	SASSI-3
WURS	r	1.000	-0.080	-0.217
	N	256	218	256
	Sig.	.	0.240	0.000
CPT	r	-0.080	1.000	0.082
	N	218	223	222
	Sig.	0.240	.	0.226
SASSI-3	r	-0.217	0.082	1.000
	N	256	222	265
	Sig.	0.000	0.226	.

* Correlation significant at .01 level (2-tailed)

Chapter 5: Discussion, Implications and Recommendations

Discussion

It is difficult to discuss the results of this study without seeing the faces of my students and remembering their stories. It is their compelling stories, as I mentioned at the outset, that spurred my interest in Attention Deficit Hyperactivity Disorder and Substance Use Disorder. This is not just an exercise of number crunching. These numbers represent real people who are struggling with real life problems. Some of these problems are treatable.

Knowledge and a diagnosis could lead to greater understanding of the difficulties people have encountered in learning and in managing their lives. One of the people in Atkins (1996) study, who was diagnosed with ADHD in adulthood, described his experience of being diagnosed as, "I find I can look back now and understand now that a lot of what I do, I did, was due to ADHD. I feel like I—that I had been given a flashlight to see through the fog. It changed how I looked at myself..."(p. 70). This new perspective can lead to a redefining of oneself. It may stop destructive labeling and self-degradation and encourage ABE students to take a gentler and kinder perspective of themselves. Hopefully, this view will help build self-esteem. "When adults are diagnosed with ADHD, they are able to put many aspects of their lives into a new framework" (Schubiner, Tzelepis, Isaacson, Warbasse, Zacharek & Musial, 1995, p.148). The purpose of this study was to seek empirical verification of my observations and experience, substantiated by my colleagues, to guide our practice in Adult Basic Education.

The incidence levels of childhood ADHD as measured by the WURS with a cutoff of

36 or higher, were 49.6 % of the ABE students. The WURS cutoff at 46 or higher identified 31.64 % of the ABE students. Both of these results dramatically exceed the general population estimates of 3-5 % by Barkley (1994), 6-10 % by Wender (1995) or 6-9 % by Wilens, Biederman, Spencer and Frances (1994). In addition, the WURS may also have missed some of the inattentive subtype (Brown, 1995). Shaffer (1994) criticizes the use of such a tool as the WURS because the diagnosis is relying on the patient's recall of his/her childhood behaviour. However, Spencer (1996) did not find the need for corroborating sources. Spencer's and his colleagues' experience was that individuals with ADHD give accurate histories since they have lived with the disorder all their lives. They have shown that an adult diagnosis of ADHD based on self-report is clinically valid (Biederman, Wilens, Mick, Milberger, Spencer & Farone, 1995). Murphy and Barkley (1996) found significant correlation ($p < .001$) between childhood ratings of ADHD symptoms by self-referred adults and their parents.

The persistence of ADHD into adulthood has been documented (Mannuzza et al., 1993; Weiss & Hechtman, 1993). Barkley (1994) proposed 20 to 65 % of ADHD children carry their symptoms into adulthood, which would suggest 1 to 3 % of adults in the general population may have ADHD. Wender (1995) argued that one-third to two-thirds of ADHD children carry their symptoms into adulthood so he believes that the best guess is between 2 to 7 %. Wilens et al. (1994) assumed a 30 % persistence into adulthood, which places its prevalence in the general population at 2 to 3 percent of adults.

The Connors' CPT identified 39.9 % of the ABE students as having attention problems. Anchoring ADHD symptoms in childhood through a cutoff score of 46 on the

WURS and then using a cross tabulation with the CPT identified thirty-eight students or 14 % of ABE students with possibly persistent ADHD. Using Wilens et al. (1994) persistence rate of 30 %, we could have expected 24 students or 9.49 % at a cutoff score of 46 on the WURS, and 38 students or 14.84 % at a cutoff score of 36 on the WURS. In either case, the persistence of ADHD like symptoms is substantially greater in the ABE study than in the general adult population. In addition, Connors' CPT results would have been higher if they included those students who were suggested for further observations, and if students were required to abstain from smoking prior to taking the CPT (Levin, Wilson, Rose & McEvoy, 1996).

Levin, Wilson, Rose and McEvoy (1996) found that nicotine improved cognitive function on the Connors' CPT by improving the consistency of responses, which is one of the measures of attentiveness. They speculate that smokers might be self-medicating. They said, "It seems most likely that groups who smoke most heavily may be most likely to be engaging in self-medication" (p. 429). Wilens (1996) concurred that nicotine enhances attention by stimulating the neurotransmitter release. He claimed that 75 % of ADHD adults will have had an addiction to nicotine. Hand polls in ABE Intake classes indicate that smoking is extremely common in this population. This may also explain the surprising lack of significance between the WURS and the CPT. The fact that the Connors' CPT measures only visual vigilance and not auditory attention, may have contributed to missing those who only have auditory attending problems.

The high probability of addictions amongst ABE students is alarming. The SASSI-3, which is measuring the life occurrence of a Substance Use Disorder, indicated that half of ABE students seem to be at risk. This is nearly double the United States rates of 27 % for

the general population (Wilens, 1996). The Canadian Centre on Substance Abuse (1997) reports that one in ten adult Canadians (9.2 %) say they have problems with alcohol and that one in four Canadians have used an illegal substance. In Saskatchewan in 1995/96 recovery centre services were used by 8,243 clients. Over two-thirds of these clients were male (68 %), nearly half were Aboriginal (48 %) which is high for their 10 % proportion of the population, the largest proportion (28 %) were 30 to 39 years of age and the 20 to 29 years of age group accounted for 26 %, and two-thirds (68 %) had not completed Grade 12 (Saskatchewan Health, 1997). Substance abuse must be addressed with ABE students to help them break their cycles of dependence. These cycles result in family tragedy, broken lives and lost opportunities. Children growing up in this substance abuse environment may fall into an addictive lifestyle themselves, or they may be afflicted with Fetal Alcohol Syndrome.

In looking at ABE equity groups, 60 % of people who self-identified as having ADHD were identified as at risk by the SASSI-3. This is slightly higher than Wilens' (1996) claim that 50 % of ADHD adults have had a substance abuse problem at some point in their lives. A Chi-square Test did not show any significant relationship between equity categories and Substance Use Disorders; however, the small size of the ADHD equity group (15 people) limits the statistical comparisons.

The frequency of risk for ADHD (WURS cutoff of 46 or higher and CPT indicating attention problems) and SUD (SASSI-3 indicating a high probability of substance use disorder) occurring concomitantly was 20 students. The satisfying of these three conditions accounted for 7.81 % of the ABE study population. These 20 students represent slightly more than half (52.63 %) of the 38 students that were identified as at

risk for ADHD. Again this matches Wilens (1996) results that 50 % of ADHD adults will have had a substance abuse problem at some point in their lives.

A significant relationship (0.05 level of probability) was found between the WURS and the SASSI-3. Wilens et al. (1994) report a high bi-directional overlap between ADHD and SUD. Both disorders run in families; they may share a genetic defect; they are influenced by their environment; and in addition, they often share some serious mental health problems (Biederman et al., 1997; Blum et al., 1996; Carroll & Rounsaville, 1993; Goodwin, Schulsinger, Hermansen, Guze, Winokur, 1975; Horner & Schiebe, 1997; Levy, Hay, McStephen,Wood & Waldman, 1997; Pihl, Peterson & Finn, 1990; Tarter et al., 1990). Although two serious mental health problems, conduct disorder and bipolar disorder (also known as manic-depressive illness) are strongly predictive of future substance use disorder, ADHD alone is a risk factor for the development of a substance use disorder (Biederman et al., 1995). "Persistent ADHD was again found ...to be associated with a two-fold risk for a substance use disorder. Among subjects with an alcohol use disorder ADD significantly increased the risk for a substance drug use disorder and subjects with ADHD had a more chronic substance problem with continued substance abuse after substance dependence" (Wilens, 1996). When ADHD is combined with coexisting disorders such as conduct disorder, bipolar disorder or other mood disorders, the outcome becomes more bleak.

Surprisingly, there were no significant relationships between ADHD or SUD by gender, age or equity groups. Among children with ADHD three times more boys are identified than girls and this ratio seems to hold in adult diagnoses (Barkley, 1994). Substance Use Disorders have an earlier onset in people with ADHD. Wilens (1996)

reported that full criteria for substance abuse occurs three years earlier in ADHD adults (age 19 years) than in controls (age 22 years). In the ABE sample those under 30 years of age accounted for 30 % out of the 50 % that showed a risk for addictions. With the equity groups there had been an anticipated relationship with the ADHD group or the Aboriginal group for substance use disorders. This was based on Wilens' (1996) results of 50 % of ADHD adults having substance abuse and on the high proportions of drug and alcohol abuse reported in the literature about Aboriginal people (Beauvais, 1996; Indian and Northern Affairs Canada, 1998; Napoleon, 1991; Saskatchewan Health, 1997; Westermeyer, 1996).

Implications

The most important findings of this study were as follows:

- the high rate of persistent ADHD symptoms into adulthood (14 % on the combined WURS and CPT)
- the high rate of apparent childhood ADHD (31 to 49 % on the WURS)
- the high level of current attention problems (40 % on the CPT)
- the high rate of possible Substance Use Disorders (51 % on the SASSI-3)
- the significant correlation between possible childhood ADHD and later Substance Use Disorders (WURS and SASSI-3)

As a result of these findings and the literature review, Adult Basic Education instructors, counsellors and administrators need to recognize that ADHD and Substance Use Disorders are realities in the ABE environment. Nearly half of the ABE students seem to be currently struggling with maintaining attention. Half of the ABE students are at serious risk for Substance Use Disorders and the perpetuation of the substance abuse

cycle in their families. These students require intervention and support. These two barriers, Substance Use Disorders and ADHD, require changes in program delivery, program content, accommodations, and follow-up to ensure student success. With this in mind the following suggestions are made:

1. Continue proactive work of Intake/Assessment Screening for ADHD and Substance Use Disorders. Explore additional assessment tools that may assist a medical diagnosis.
2. Follow-up and monitor ABE students who are screened at risk for ADHD and PSUD. Encourage and nurture ABE student support groups for addictions and ADHD.
3. Incorporate information about drug and alcohol abuse more strongly in the curriculum. Provide greater staff support for organizing Substance Abuse and ADHD workshops and provide stronger incentives for student participation.
4. Notify other ABE programs and the Saskatchewan Department of Post-Secondary Education and Skills Training of the results of this study.
5. Educational institutes such as SIAST need to develop a working relationship with the medical community and addiction treatment centres. The goal would be to provide a multidisciplinary approach to assessment. Besides sharing information about adult ADHD and addictions, the educational institute could offer collaborative support in the diagnosis of ADHD by providing psycho-educational evaluations and by providing follow-up to treatment regimes through classroom observations and additional testing on the CPT.

Limitations of the study

The study would have been strengthened by including a behaviour rating list for adult ADHD that reflects the DSM-IV criteria. A behaviour rating scale was included in the original study, but it was based on the DSM-III. It had not been normed, nor could it be converted (See communication with Barkley (1998) Appendix F).

A very specific population, ABE students at Wascana Campus of SIAST, was studied. These results may be useful to other ABE programs, particularly the sister campuses of Kelsey, Palliser and Woodland, but they may not be applicable to other educational programs with different populations. Furthermore, ADHD and Substance Use Disorders may be cultural constructions.

Recommendations for Further Research

Based on the findings of this study, it would seem to be beneficial to conduct:

1. Further research into the screening for ADHD and/or Substance Use Disorders as predictors of academic success in ABE.
2. Additional research to see if the screening for the risk of ADHD and/or Substance Use Disorders is acted on by the student and leads to a diagnosis or a change in performance. Is there a link between diagnosis and success in ABE?
3. Ongoing research with the aim of collecting enough raw data so normative samples could be developed for the ABE student population.
4. Further research into the incidence of nicotine use in ABE students and testing could be done using the Connors' CPT to assess the impact of nicotine on attention indicators.
5. Epidemiological studies that could examine other comorbid disorders with ADHD

and Substance Use Disorders such as conduct disorder, depression and anxiety in the ABE student population.

6. Familial studies that assess the prevalence of ADHD, Substance Use Disorders, and Fetal Alcohol Syndrome in first degree relatives.
7. Further research into the kinds of accommodations and teaching strategies that lead to success for ABE students with ADHD.

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Appendices

Appendix A: Intake/Assessment Forms

Wascana INSTITUTE
SIAST SASKATCHEWAN INSTITUTE OF APPLIED SCIENCE AND TECHNOLOGY

Wetmore Centre
2241 Wallace Street
P.O. Box 556
Regina, SK S4P 3A3
Phone: (306) 787-1403
Fax: (306) 787-5104
Toll Free: 1-800-667-7730

PERMISSION TO ADMINISTER TESTS

I, _____, Acknowledge that I understand the nature of the attached test battery and based on my understanding, I agree to complete the various described tests.

I understand that my test results will be shared through group presentation and individual interviews. Results will only be used by the Intake Team to help in making an educational plan.

Student: _____
(Signature)

Witness: _____

Instructor: _____

Date: _____

STONEHOUSE.INFOREQUEST
August, 1996

DESCRIPTION OF TEST BATTERY

1) **Raven's Progressive Matrices (RPM)** is a test of general intelligence that requires an individual to solve progressively more difficult patterns. The RPM is relatively free of culture and educational level bias. It will give us an idea of your potential.

2) **The Wide Range Achievement Test (WRAT-R)** is to measure the codes which are needed to learn the basics of spelling and arithmetic. It will tell us your present grade level in mathematics and spelling.

3) **Rey's Complex Figure** is a test in which you are asked to do a line drawing of a complex figure. It will show us how you organize and benefit from teaching.

4) **Structure of the Intellect (SOI)** is an aptitude test assessing abilities and thinking. The twenty-six different subtests correlate to the kind of thinking skills required in a school setting. The developers of the SOI believe that through mediation, intelligence can be trained. One of the major advantages of the SOI is that they refer you to materials to train low abilities.

5) **Myers-Briggs Type Indicator (MBTI)** is a personality questionnaire that combines preferences on four bipolar traits to indicate on of sixteen psychological types. Learning style information from the MBTI type provides valuable direction for the student and the instructor. Career information and self-exploration can also be part of the MBTI.

6) **The Coopersmith Self-Esteem Inventory** is twenty-five short statements designed to measure attitudes to self in social, academic, family, and personal areas of experience. It will help us to see if your attitudes will support you or pull you down.

7) **Peabody Picture Vocabulary Test (PPVT)** is designed primarily to measure an individual's receptive (Hearing) vocabulary for Standard American English. It shows the extent of English vocabulary acquisition. Although not perfect, vocabulary is the best single index of success in school.

8) **Woodcock Johnson Tests of Cognitive Ability and Achievement-Revised (WJ-R)** is a diagnostic test of cognitive abilities and achievement used to identify learning difficulties.

9) **Attention Deficit/Hyperactivity Disorder (AD/HD)** is a neurobiological disability that has symptoms of inattention, impulsivity and in some cases, hyperactivity. AD/HD can interfere with learning. We will use the Wender Utah Rating Scale, the DSM-IV Behavior Rating Form, observation guides and Barkley's Self-rating Symptom Checklist for ADHD Adults and Barkley's Semi-structured Interview for Adult ADHD to help us to screen for students at risk for AD/HD.

10) **The Substance Abuse Subtle Screening Inventory (SASSI)** is a highly effective measure for both adults and adolescents to detect alcohol and the full range of illicit drug abuse patterns. It helps to identify people at risk for chemical dependency.

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PERMISSION FOR RELEASE OF INFORMATION TO

ADULT BASIC EDUCATION STAFF

I, _____, give the Intake/Assessment Instructor permission to share information with my instructors and the Adult Basic Education professional staff, regarding my Personal Program Plan and test results. This also allows Wascana Institute to use my test results, without identifying me, for research and follow up of their programs.

Student: _____
(Signature)

Witness: _____

Instructor: _____

Date: _____

STONEHOUSE.INFOREQUEST
August, 1996

Appendix B: Tips for Helping Students with ADHD

The following revised list features some of the suggestions from Vogel, Hallowell and Ratey, and CH.A.D.D. for student accommodations:

Instructional Practices

1. Make the syllabus available four to six weeks in advance and be available to discuss it with the student.
2. Begin lectures with a review of the last lecture and provide an overview and outline of the lecture that is to be given. Summarize periodically throughout the lecture and at the end.
3. Provide structure that gives time limits, previews, repetition, and includes reminders and directions.
4. Ask the student what will help.
5. Emphasize important points, main ideas and key concepts orally and by coloured underlining.
6. Reduce visual and auditory distractions.
7. Make frequent eye contact and encourage the student to sit close to the instructor.
8. Allow opportunities for question and answer and discussions.
9. Be active, playful, and flamboyant in presenting information.
10. Establish routines and allow time for transitions.
11. Teach organizational and time management strategies as well as study skills strategies. Remember to monitor and encourage their implementation.
12. Be available outside of class time for clarification or discussion.

13. Encourage reading out loud and experimenting with moving while they read or study.
14. Encourage physical exercise.
15. Try to put the student with ADHD into small classes and allow them to carry a reduced course load.
16. Give frequent feedback and encouragement.
17. Remember the three best treatments are one on one tutoring, highly motivating material, and novelty.

Testing

1. Remember testing is very hard for students with ADHD because of their vulnerability to distraction and impulsivity, which is compounded by pressure.
2. Allow extended time (usually double) on exams. Research on timed versus power reading tests reveal that normally achieving students do not show substantially increased performance when given extra time, whereas students who are disabled do significantly better when given extra time. Also the extra time needed seemed to vary a great deal (Runyan, 1992).
3. Provide exams in alternate formats such as objective instead of essay type or vice versa.
4. Allow students to write exams in a separate room free from distractions where they can subvocalize or move around.
5. Allow students to answer exam questions in other ways than handwriting such as by typing or giving answers orally.
6. Allow the student to clarify or rephrase exam questions so they feel sure that they

understand what the question is asking them.

7. Allow students alternate ways to show their mastery of the subject material by doing a research paper or a class presentation.
8. Allow students to use aids such as calculators or word processors for exams.
9. Avoid complex sentence structure and ambiguity in exam questions.
10. Provide lots of space to write answers and extra exam booklets.

ABE programs need to incorporate these suggestions if they expect to serve the needs of their students with ADHD.

Appendix C: Letters of Approval

Wascana INSTITUTE

SIAST SASKATCHEWAN INSTITUTE OF APPLIED SCIENCE AND TECHNOLOGY

Memorandum

DATE: April 27, 1998

TO: Robin Stonehouse

FROM Al Douglas, Acting Campus Director

RE: **Wascana Campus Student Data for Master's Thesis**

Please consider this as formal approval for you to use Wascana Campus student data for your Master's Thesis.

As I scanned your thesis my main concern was over the issue of confidentiality of student records.

However, I was pleased to see a form entitled " Permission for release of information to adult basic education staff" in the package. The text of that form seems plain enough ... allows Wascana Institute to use my test results ... for research and follow up of their programs. I am confident that the release form adequately protects SIAST.

Please accept my congratulations for your educational achievements and my thanks for your dedication and commitment to students.

If I can be of further assistance, please don't hesitate to call me.

Al Douglas

c: Brian Kraus

#92

UNIVERSITY OF REGINA

FACULTY OF GRADUATE STUDIES AND RESEARCH MEMORANDUM

DATE: June 16, 1998

TO: C. 'Robin" Stonehouse
Grp Box 201 Comp. 10 RR#2
Regina, SK S4P 2Z2

FROM: G.W. Maslany, Chair
Research Ethics Review Committee

Re: The Relationship Between Attention Deficit/Hyperactivity Disorder and Substance Use Disorders Amongst Adult Basic Education Students

---

Please be advised that the committee has considered this proposal and has agreed that it is:

__X__ 1. Acceptable as submitted.
(Note: Only those applications designated in this way have ethical approval for the research on which they are based to proceed.)

_____ 2. Acceptable subject to the following changes and precautions (see attached):
Note: These changes must be resubmitted to the Committee and deemed acceptable by it prior to the initiation of the research. Once the changes are regarded as acceptable a new approval form will be sent out indicating it is acceptable as submitted.
Please address the concerns raised by the reviewer(s) by means of a supplementary memo.

_____ 3. Unacceptable to the Committee as submitted. Please contact the Chair for advise on whether or how the project proposal might be revised to become acceptable (ext. 4161/5186.)

G.W. Maslany

cc: F. Bessai, Supervisor

GM/ab/ethics2.dot

Appendix D: Wender Utah Rating Scale

D

WENDER UTAH RATING SCALE

PATIENT'S INITIALS _____ PATIENT'S NUMBER _____ DATE _____ M.D.'s INITIALS _____

AS A CHILD I WAS (OR HAD):	Not at all or very slightly	Mildly	Moderately	Quite a Bit	Very Much
1. Active, restless, always on the go					
2. Afraid of things					
3. Concentration problems, easily distracted					
4. Anxious, worrying					
5. Nervous, fidgety					
6. Inattentive, daydreaming					
7. Hot or short tempered, low boiling point					
8. Shy, sensitive					
9. Temper outbursts, tantrums					
10. Trouble with stick-to-it-iveness, not following through, failing to finish things started					
11. Stubborn, strong willed					
12. Sad or blue, depressed, unhappy					
13. Uncautious, dare-devilish, involved in pranks					
14. Not getting a kick out of things, dissatisfied with life					
15. Disobedient with parents, rebellious, sassy					
16. Low opinion of myself					
17. Irritable					
18. Outgoing, friendly, enjoy company of people					
19. Sloppy, disorganized					
20. Moody, have ups and downs					
21. Feel angry					
22. Have friends, popular					
23. Well organized, tidy, neat					
24. Acting without thinking, impulsive					
25. Tend to be immature					
26. Feel guilty, regretful					
27. Lose control of myself					
28. Tend to be or act irrational					
29. Unpopular with other children, didn't keep friends for long, didn't get along with other children					
30. Poorly coordinated, did not participate in sports					

AS A CHILD I WAS (OR HAD):	Not at all or very slightly	Mildly	Moderately	Quite a Bit	Very Much
31. Afraid of losing control of self					
32. Well coordinated, picked first in games					
33. (for women only) Tomboyish					
34. Ran away from home					
35. Get in fights					
36. Teased other children					
37. Leader, bossy					
38. Difficulty getting awake					
39. Follower, lead around too much					
40. Trouble seeing things from someone else's point of view					
41. Trouble with authorities, trouble with school, visits to principal's office					
42. Trouble with the police, booked, convicted					
MEDICAL PROBLEMS AS A CHILD:					
43. Headaches					
44. Stomachaches					
45. Constipation					
46. Diarrhea					
47. Food allergies					
48. Other allergies					
49. Bedwetting					
AS A CHILD IN SCHOOL:					
50. Overall a good student, fast					
51. Overall a poor student, slow learner					
52. Slow reader					
53. Slow in *learning* to read					
54. Trouble reversing letters					
55. Problems with spelling					
56. Trouble with mathematics or numbers					
57. Bad handwriting					
58. Though I could read pretty well, I never really enjoyed reading					
59. Did not achieve up to potential					
60. Repeated grades (which grades?) _____					
61. Suspended or expelled (which grades?) _____					

Source. Paul H. Wender, M.D., University of Utah School of Medicine, Salt Lake City, UT 84132

Scoring: Not at all = 0.
Mildly = 1.
Moderately = 2.
Quite a bit = 3.
Very much = 4.

Wender Utah Rating Scale Ratings of Adults with Attention Deficit Hyperactivity Disorder, Normal Comparison Subjects, and Depressed Comparison Subjects

	Adults with Attention Deficit Hyperactivity Disorder (N=81)		*Normal Comparison Subjects (N=100)*		*Depressed Comparison Subjects (N=70)*	
WURS Item	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
Individual Items						
Concentration problems, easily distracted	3.3	0.9	0.7	0.9	1.3	1.4
Anxious, worrying	2.8	1.1	1.1	1.0	2.1	1.3
Nervous, fidgety	3.1	0.9	0.6	0.9	1.7	1.4
Inattentive, daydreaming	3.2	1.0	0.6	0.8	1.7	1.4
Hot-or short-tempered, low boiling point	2.7	1.3	0.8	1.0	1.0	1.2
Temper outbursts, tantrums	2.4	1.2	0.6	0.9	1.0	1.5
Trouble with stick-to-it-tiveness	3.0	1.1	0.7	0.9	1.3	1.3
Stubborn, strong-willed	3.1	1.1	1.4	1.2	1.7	1.2
Sad or blue, depressed, unhappy	2.2	1.2	0.4	0.7	2.0	1.4
Disobedient, rebellious, sassy	2.4	1.4	0.5	0.7	0.7	1.1
Low opinion of myself	2.6	1.3	0.7	0.8	2.2	1.5
Irritable	2.4	1.1	0.4	0.6	1.2	1.1
Moody, ups and downs	2.8	1.0	0.8	0.8	1.8	1.3
Angry	2.5	1.2	0.6	0.8	1.4	1.3
Trouble seeing things from someone else's point of view	2.3	1.1	0.8	1.2	1.0	0.8
Acting without thinking, impulsive	2.9	1.1	0.8	0.9	1.4	1.2
Tendency to be immature	2.8	1.6	0.7	0.9	1.1	1.1
Guilty feelings, regretful	2.6	1.1	0.6	0.8	1.8	1.4
Losing control of myself	2.2	1.3	0.3	0.6	0.8	1.0
Tendency to be or act irrational	2.0	1.2	0.2	0.5	0.9	1.1
Unpopular with other children	1.8	1.3	0.2	0.5	0.8	1.0
Trouble with authorities, trouble with school, visits to principal's office	1.8	1.6	0.2	0.6	0.4	0.8
Overall a poor student, slow learner	1.4	1.4	0.1	0.3	0.5	0.7
Trouble with mathematics or numbers	2.1	1.5	0.5	1.0	1.1	1.4
Not achieving up to potential	3.2	1.0	1.1	1.2	1.8	1.5
Total scores						
Men	60.3	14.2	17.9	11.0	34.2	18.0
Women	65.8	14.3	15.0	8.5	30.5	15.8
All subjects	62.2	14.6	16.1	10.6	31.7	17.4

Appendix E: Connors' Continuous Performance Test

CONNERS' CONTINUOUS PERFORMANCE TEST
Multi-Health Systems Inc.

Report For:	Robin Stonehouse
Patient/Subject #:	1
Birthdate (mmddyy):	03/11/49
Sex:	M
Age:	47
Medication Type:	
Medication Amount:	
Test #:	1
Tested (mmddyy):	09/11/96
Paradigm:	STANDARD
Test Time:	min: 14 sec: 10 ms: 250

OVERALL SUMMARY BASED ON COMPARISON TO GENERAL POPULATION DATA

MEASURE	VALUE	T-SCORE	PERCENTILE	GUIDELINE
# Hits	322 (99.4%)	*	74.06	within average range
# Omissions	2 (0.6%)	*	74.06	within average range
# Commissions	26 (72.2%)	68.98	97.71	MARKEDLY ATYPICAL
Hit RT	283.51	65.82	95.35	ATYPICALLY FAST
Hit RT Std Error	3.98	40.57	19.99	within average range
Variability of SEs	3.84	38.43	12.41	good performance
Attentiveness (d')	1.74	68.47	96.75	MARKEDLY ATYPICAL
Risk Taking (B)	0.05	55.47	70.75	within average range
Hit RT Block Change	-0.01	42.66	26.33	within average range
Hit SE Block Change	-0.01	48.44	43.81	within average range
Hit RT ISI Change	0.03	48.69	48.75	within average range
Hit SE ISI Change	-0.06	44.98	34.38	within average range

* For hits and omissions, nature of data dictates use of percentiles only.

Conversions were made for HITS, HIT RT, and d' so that high T-scores (i.e., >= 60) provide evidence of a problem for ALL measures listed in the table. For example, without a conversion, a HITS T-score of 33 would indicate a lot of errors and a potential attention problem. This score of 33 is 17 BELOW the normative average of 50. To make high scores consistently indicative of a problem, this score is converted to 17 points ABOVE 50 which is 67.

Note that percentile values higher than 90 or 95 correspond to atypical responses. Percentile values must be much higher than T-scores before being considered atypical.

For B, both high AND low scores are noteworthy. Low scores indicate too frequent responding usually related to impulsivity. High T-scores for B indicate atypically low number of responses usually related to inattention.

The more measures showing up as atypical, the more likely that a problem exists. The presence of only one atypical measure does not usually indicate a problem.

INTERPRETIVE GUIDE

The Conners' CPT provides a rich source of information. The meaning of each individual component is presented first, then the information is synthesized into overall comments.

COMMENTS REGARDING THE TEST COMPONENTS:

Even in individuals with severe attention deficits, it is rare that all component measures will indicate attention problems. If 0 or only 1 component is atypical, this rarely is an indication of an attention problem. If 2 or more components are atypical, then the possibility of an attention problem should be considered more seriously. The more measures that are atypical, the more evidence there is for an attention problem.

Overall Processing Speed (Overall Hit Reaction Time)

This represents the average speed of correct responses for the entire test.

In this case, Robin Stonehouse is very fast but also makes many impulsive errors, suggesting that the fast speed is part of an impulsive response pattern.

Overall Attentional Variability (Overall Standard Error)

High levels of variability indicate inconsistency in speed of responding - a sign of fluctuating attention from trial to trial.

Robin Stonehouse's responses were about as consistent as other typical individuals from the population.

Speed Decrement Over Time (Pattern of Hit Reaction Time)

Some individuals tend to lack the ability to maintain their speed over time, indicating a loss of effort or energy in their responses.

Robin Stonehouse's responses did NOT, however, slow down to any great degree over the course of the test.

Variability Over Time (Pattern of Standard Error)

If an individual becomes more variable over time in their speed of response, then this may indicate a gradual loss of sustained attention.

Robin Stonehouse's responses show no unusual loss of consistency over time.

Omissions

Inattentiveness may be caused by temporary blocks in responding, or actual looking away from the test when signals are presented. A high level of omissions indicates such a loss of attentiveness.

Robin Stonehouse had a mildly elevated number of omission errors.

Commissions

Commission errors may represent an inability to withhold motor responses as a result of an impulsive response tendency.

Robin Stonehouse made many commission errors suggesting impulsivity or an impaired ability to control motor responses.

Perceptual Sensitivity (d')

Errors in responding may represent difficulties in discriminating the perceptual features of signals (all letters except X) and non-signals (Xs).

Values of d' for Robin Stonehouse indicate poor perceptual sensitivity.

Response Bias (B)

Beta (B) represents an individual's response tendency: Some individuals are cautious and choose not to respond very often. These individuals will obtain high Beta T scores. Others are more risk-taking or impulsive and respond more frequently than they should. These individuals will obtain low Beta T scores.

Robin Stonehouse's value of B indicates a response tendency which is typical of other individuals in the general population.

Activation/Arousal (Inter-Stimulus Statistics)

People tend to adjust their speed of reactions according to how fast the stimuli occur. When the stimuli are presented quickly, brain activation/ arousal is high and responses tend to be fast. When the stimuli are presented slowly, brain activation/arousal is low and responses tend to be slower and less consistent.

Robin Stonehouse did not show any atypical change in response pattern when the letters were presented slowly.

OVERALL COMMENTS REGARDING ROBIN STONEHOUSE'S TEST

For most measures, Robin Stonehouse's performance on the Conners' CPT did not indicate attention problems. However, Robin Stonehouse...

...gave atypically fast responses which, when accompanied by a high number of commission errors, indicates impulsivity.
...made a large number of commission errors indicating impulsive responding, and difficulties with inhibiting responses.
...showed poor perceptual sensitivity.

Overall INDEX = 9.39

This type of response pattern alone does NOT strongly suggest an attention problem, but further observations and testing of this individual would be advisable.

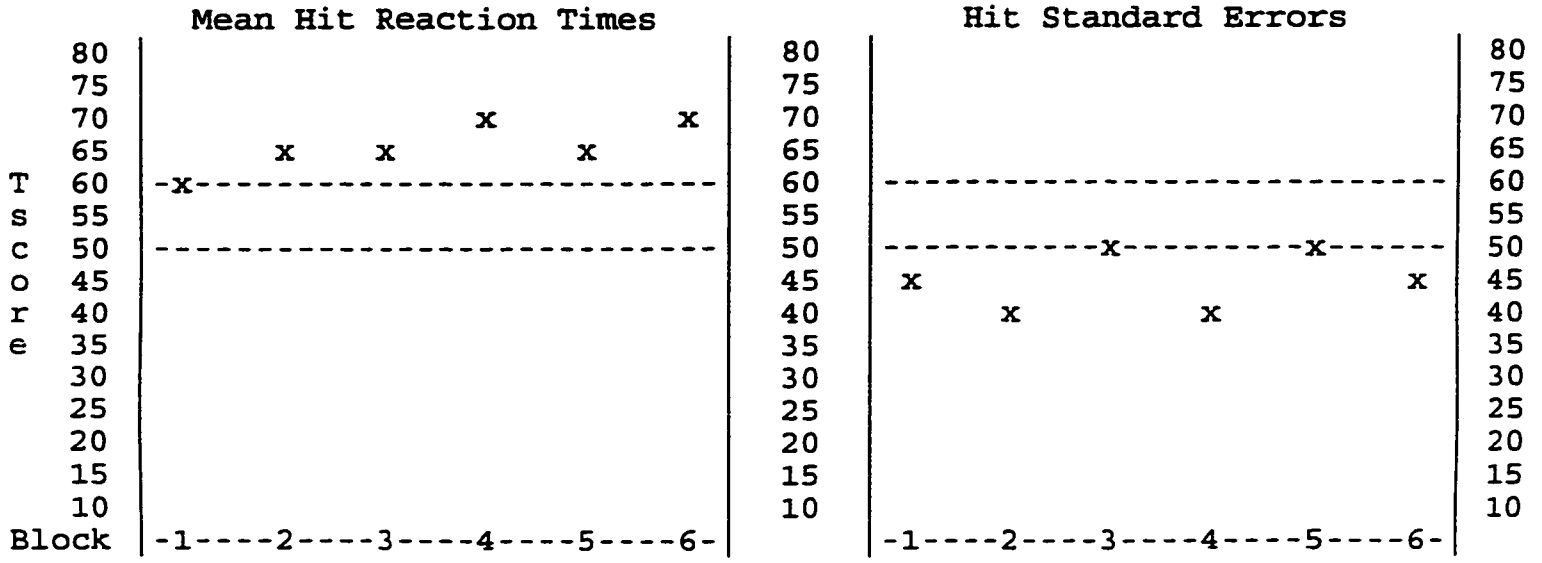
Important Additional Notations

The comments in this report are based on general patterns apparent in the responses of Robin Stonehouse. Always examine the graphs and information provided carefully to refine (and add to) the interpretations given. For instance, you will want to consider the statistics that are not explicitly discussed in this printed report. Please consult the Conners' CPT manual, or use the help keys while examining "on screen" reports for information about the measures.

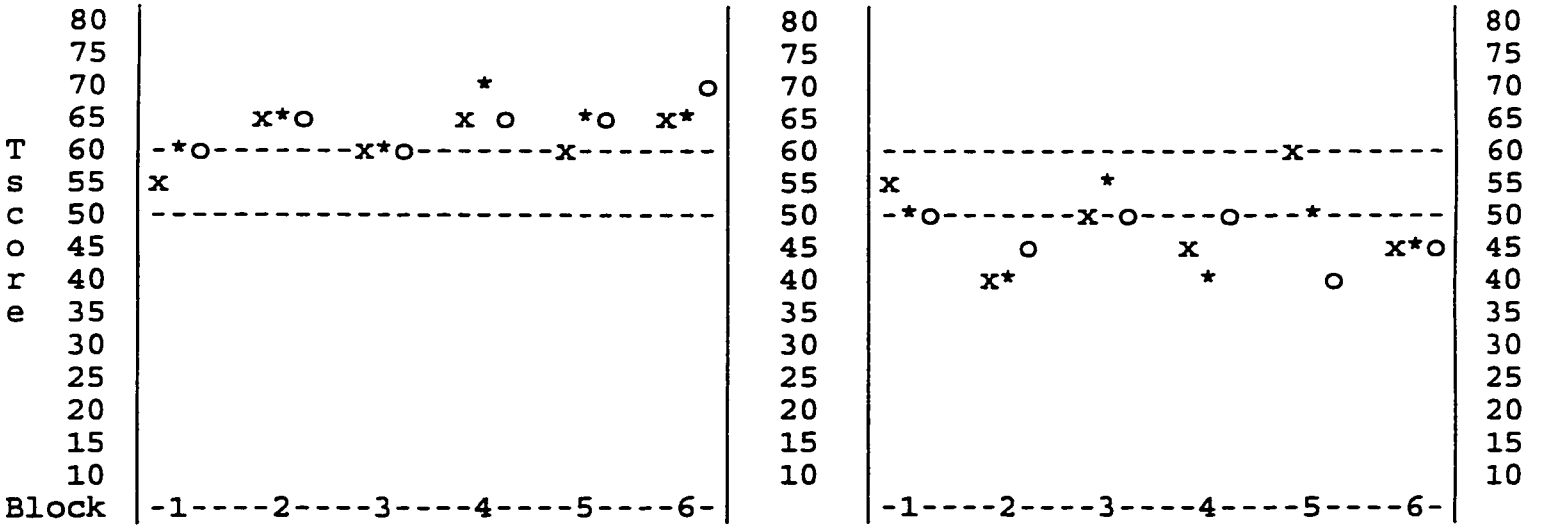
The comments made in this report should be used as an aid in the assessment process. Other sources of information (e.g., tests, observations, historical information) should be used in conjunction with the information from the Conners' CPT when assessing an individual. The information contained in this report should be treated as confidential.

DATA ARE COMPARED TO THE GENERAL POPULATION STUDY GROUP

Data are collapsed across the 3 ISIs within each block
Legend: x = in range, + = out of range



Data are for each of the 3 ISIs within each block
Legend: x = 1 sec ISI, * = 2 sec ISI, o = 4 sec ISI, + = out of range



DETAILED REPORT STATISTICS BY BLOCK (ISI COLLAPSED)

Block #	:	1		2		3		4		5		6	
# Trials	:	60		60		60		60		60		60	
Targets	# %:	54	90	54	90	54	90	54	90	54	90	54	90
Hits	# %:	53	98	54	100	53	98	54	100	54	100	54	100
Omissions	# %:	1	2	0	0	1	2	0	0	0	0	0	0
Non-Targets	# %:	6	10	6	10	6	10	6	10	6	10	6	10
Rejections	# %:	2	33	3	50	1	17	1	17	1	17	2	33
Commissions	# %:	4	67	3	50	5	83	5	83	5	83	4	67
Overall RT	:	286		283		294		262		290		269	
Hit RT	:	291		286		299		262		295		268	
Commission RT	:	220		236		242		262		230		285	
Hit RT Std. Err:		10.64		8.09		10.36		7.91		11.42		8.48	

DETAILED REPORT STATISTICS BY BLOCK

ISI = 1 Second

Block #	:	1		6		9		10		14		17	
# Trials	:	20		20		20		20		20		20	
Targets	# %:	18	90	18	90	18	90	18	90	18	90	18	90
Hits	# %:	17	94	18	100	18	100	18	100	18	100	18	100
Omissions	# %:	1	6	0	0	0	0	0	0	0	0	0	0
Non-Targets	# %:	2	10	2	10	2	10	2	10	2	10	2	10
Rejections	# %:	1	50	1	50	1	50	1	50	1	50	1	50
Commissions	# %:	1	50	1	50	1	50	1	50	1	50	1	50
Overall RT	:	278		291		279		234		296		256	
Hit RT	:	281		295		282		235		300		256	
Commission RT	:	220		220		220		220		220		270	
Hit RT Std. Err:		20.31		15.08		16.53		9.79		27.36		15.40	

ISI = 2 Seconds

Block #	:	2		4		8		12		13		18	
# Trials	:	20		20		20		20		20		20	
Targets	# %:	18	90	18	90	18	90	18	90	18	90	18	90
Hits	# %:	18	100	18	100	17	94	18	100	18	100	18	100
Omissions	# %:	0	0	0	0	1	6	0	0	0	0	0	0
Non-Targets	# %:	2	10	2	10	2	10	2	10	2	10	2	10
Rejections	# %:	1	50	2	100	0	0	0	0	0	0	1	50
Commissions	# %:	1	50	0	0	2	100	2	100	2	100	1	50
Overall RT	:	282		277		292		258		275		268	
Hit RT	:	286		277		300		259		281		268	
Commission RT	:	220		0		220		245		220		270	
Hit RT Std. Err:		16.91		12.62		20.15		11.43		15.53		12.91	

DETAILED REPORT STATISTICS BY BLOCK

ISI = 4 Seconds

Block #	:	3		5		7		11		15		16
# Trials	:	20		20		20		20		20		20
Targets	# %:	18	90	18	90	18	90	18	90	18	90	18 90
Hits	# %:	18	100	18	100	18	100	18	100	18	100	18 100
Omissions	# %:	0	0	0	0	0	0	0	0	0	0	0 0
Non-Targets	# %:	2	10	2	10	2	10	2	10	2	10	2 10
Rejections	# %:	0	0	0	0	0	0	0	0	0	0	0 0
Commissions	# %:	2	100	2	100	2	100	2	100	2	100	2 100
Overall RT	:	297		283		310		294		299		282
Hit RT	:	306		287		313		293		305		280
Commission RT	:	220		245		275		300		245		300
Hit RT Std. Err:		17.57		13.94		16.35		15.46		12.89		15.06

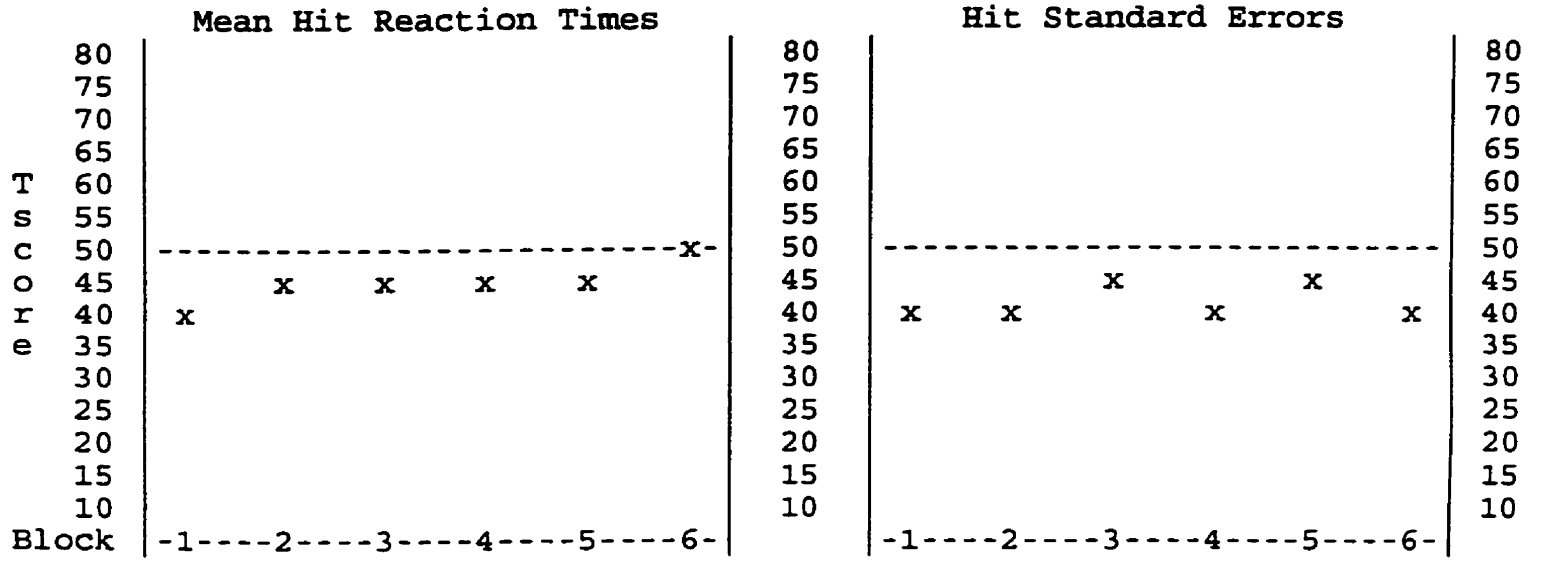
OVERALL SUMMARY BASED ON COMPARISON TO ADHD DATA

MEASURE	VALUE	T-SCORE	PERCENTILE
# Hits	322 (99.4%)	*	46.44
# Omissions	2 (0.6%)	*	46.44
# Commissions	26 (72.2%)	75.76	99.00
Hit RT	283.51	44.51	32.68
Hit RT Std Error	3.98	40.35	16.76
Variability of SEs	3.84	37.46	10.51
Attentiveness (d')	1.74	63.19	90.63
Risk Taking (B)	0.05	46.04	34.59
Hit RT Block Change	-0.01	42.38	22.32
Hit SE Block Change	-0.01	52.15	58.51
Hit RT ISI Change	0.03	36.16	8.34
Hit SE ISI Change	-0.06	40.12	16.17

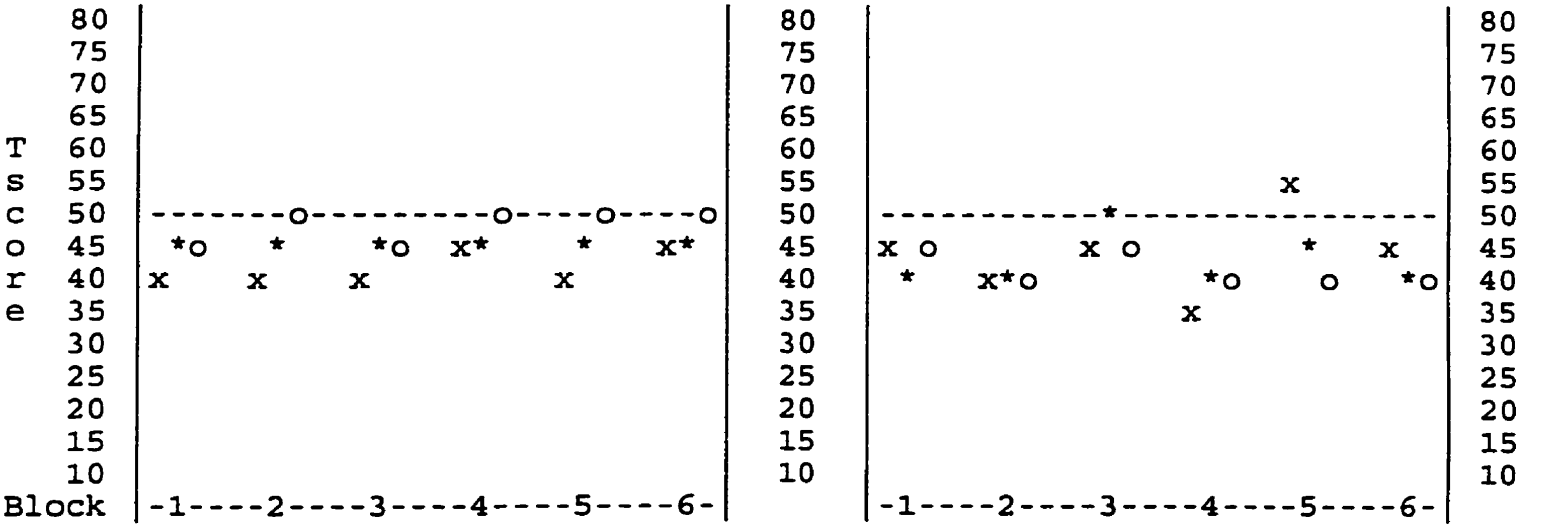
* For hits and omissions, nature of data dictates use of percentiles only.

DATA ARE COMPARED TO THE ADHD STUDY GROUP

Data are collapsed across the 3 ISIs within each block
Legend: x = in range, + = out of range



Data are for each of the 3 ISIs within each block
Legend: x = 1 sec ISI, * = 2 sec ISI, o = 4 sec ISI, + = out of range



Appendix F: Communication with R. A. Barkley

Guilford Publications, Inc.

72 Spring Street, New York, NY 10012
Phone: (212) 431-9800
Fax: (212) 9666708
E-mail: staff@guilford.com
Website: http://www.guilford.com

FAX COVER SHEET

To: Robin Stonehouse Date: 4/28/98

Company: Saskatchewan Institute Time: _____

FAX#: (306) 787-5104 # of Pages: _____

From: Christine Luberto

Dept.: Marketing

RE: Patients' Behavioral Checklist for ADHD Adults

Comments: _____

uthor: Russell.Barkley
Date: 4/27/98 4:29 PM
Priority: Normal
TO: CLUBER at GUILFORD
Subject: re: Patients' Behavioral Checklist for ADHD Adults
---------- Message Contents ----------

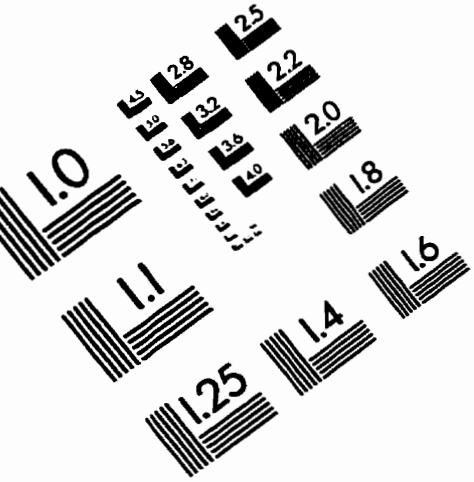
Hi Christine,

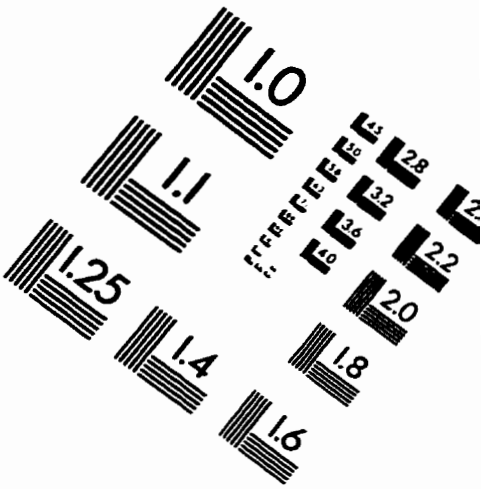
The two forms that this gentleman is asking about are not the same. The form on which he collected his dissertation data is based on DSM-III-R. The form we later published in the 1995 ADHD Report is based on DSM-IV. Although some items are the same across the two versions of the DSM, others are not. Thus, one cannot merely convert one scale to the other. Also, the normative data we collected on the 1995 scale would not be applicable to the form he used in his research given that we used the later scale. Sorry we could not be of much help to him. You can let him know that the new scale that was in the 1995 newsletter will be in the second edition of our clinical workbook on ADHD if he eventually would like to use that scale in future studies or with future patients.

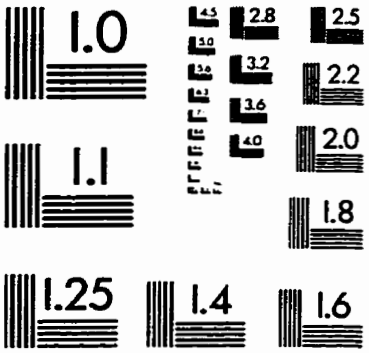
Best wishes,

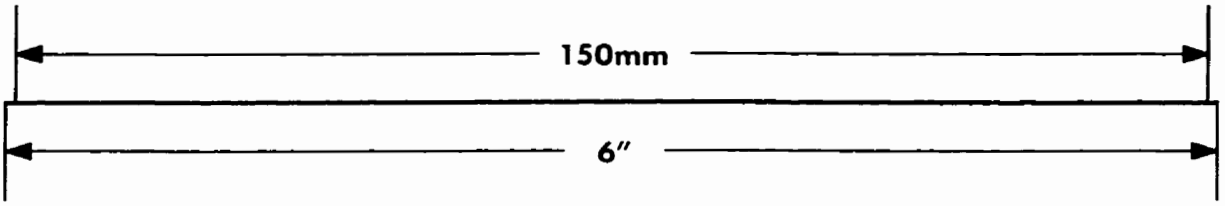
Russ Barkley

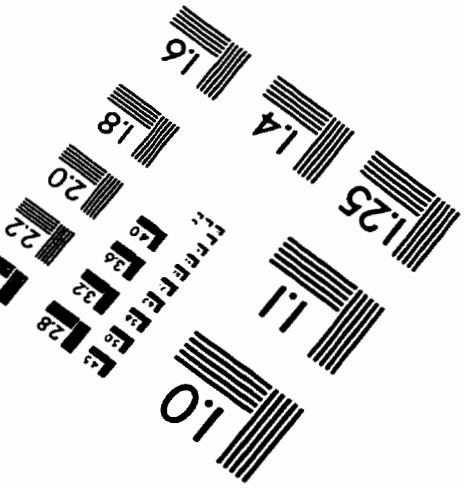
IMAGE EVALUATION
TEST TARGET (QA-3)

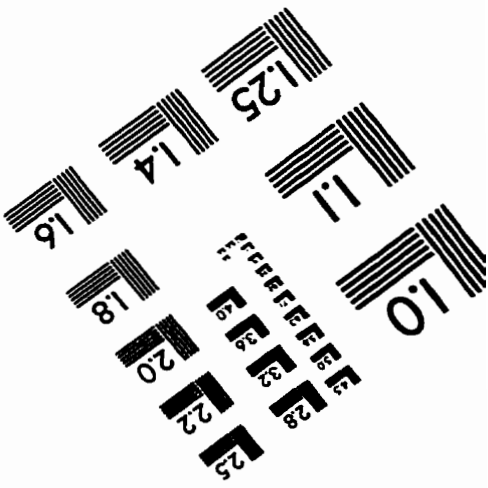












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