A Case Study on the Use of a Token Economy System to
Enhance Self-Motivation in an Intermediate School Student with ADHD

by

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A thesis submitted to the School of Community Services
in partial fulfillment of the requirements for
the degree of
Bachelor of Applied Arts in Behavioural Psychology

St. Lawrence College
Kingston, Ontario
Canada.
April, 2008
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DEDICATION

I would like to dedicate this thesis to the most important people in my world.

To my loving family:

Dad, thank you for all of your love, support, advice and for being by my side through this long, arduous process;

Mom, for providing love and support;

My wonderful siblings: Catherine, Ryan and James,

thank you for instilling confidence in me and for being there whenever I needed you.

To Grandma and Grandpa Zavazal, for all of the words of wisdom and for being my biggest fans.

To Colin, what would I have done without you. You are my prince charming. I love you! ♥

~ Thank you all for believing in me. I feel truly blessed to have all of you in my life. I love you.~
ABSTRACT

ADHD is the most common neurobehavioural disorder of childhood (Teeter, 1998). Between 15 and 20% of children and adolescents experience behavioural disorders (Wicks-Nelson & Isreal, 2006) and between 6 and 15% of school-aged children in North America suffer from ADHD (Litner & Ostiguy, 2000). The literature reviewed indicates that there are a variety of theories about the basis of ADHD from attitudinal to biological. As well there are a wide range of approaches used to deal with the disorder from behavioural to medicinal. A promising behavioural approach is a motivational strategy based on self-regulation (Reid, Trout, & Schartz, 2005). This thesis explores, through a case study, based on a token economy intervention strategy, the effectiveness of a treatment strategy that involves the individual with ADHD in the selection and control of the treatment in order to generate self-motivation as an element of self-regulation. The hypothesis is that this strategy will prove to be an effective means of reducing problem behaviours associated with ADHD. In general, the results indicate the treatment program was effective. Data was analyzed with respect to number of incidents per instructional hour and elapsed intervals between incidents for each of the two target behaviours, off task and non-compliant. Both ways of analyzing data showed significant improvement on both target behaviours. For incidents per instructional hour there was a total reduction of 90.4% during the treatment period. For off-task behaviour, the average elapsed interval between incidents showed a 1475% improvement. For non-compliant behaviour there was a 694% improvement in average elapsed interval. Four recommendations for further research were made. These are to expand the case study into a multi-participant program, to modify the program design so as to isolate the various components of self-motivation, to generalize the study to include non-academic environments, and to expand upon the work of Flood, Wilder, Flood and Masuda (2002) to incorporate peer-mediated reinforcement as a way to reduce support staff requirements.
ACKNOWLEDGEMENTS

There are many individuals with whom I am extremely grateful to for helping me complete this thesis and for being there for me through my studies. It is with my pleasure to acknowledge each of them here.

First off, my sincerest gratitude goes to my supervisor, Dr. Diane Nicholson, for all of her support and positive reinforcement. Thank you for helping me to believe in myself and my capabilities. And not to forget, thank you for all of your outstanding editing: I will always think twice before using “stated”, “impacted” and “the article said”. 😊

To Stacey Porter-Eves of the Student Support Center, for providing me with guidance and words of encouragement. For showing me real-life experience and for being a role model.

To the participant of this study. I truly believe in you.

Thank you to Marie-Line Jobin, faculty member at St. Lawrence College, for being the second reader and second editor of this thesis. Thank you for your time and input.

To my fellow BPSYCers for being there throughout the last four years and for providing assistance whenever needed. We became one large family and I will never forget any one of you. Special thanks goes to Martha, Jess, Andrew, Sarah, Alison, and Tiffany for always having a smile and helping me to realize that we are all in this together.

My deepest appreciation goes to the immediate members of my family: my father, my mother, my grandparents, sister and brothers, in which all their love and support helped me to complete this thesis. Thank you for being my cheerleaders. Words cannot describe how grateful I am to have all of you in my life. I love all of you.

Last but not least, to Colin. Thank you for being there for me no matter what. You are my everything. Thank you for your unconditional love and eternal patience. I love you with all my heart. ♥

Again, thank you to everyone. I could not have done this without you.
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Chapter I: Introduction

The name, definition and prevailing diagnostic criteria for what we today call Attention-Deficit / Hyperactivity Disorder have changed at least five times in the past few decades. This reflects changes in our conceptualisation of the disorder but creates confusion among practitioners and the public, and makes the task of standardizing samples in research very difficult (Robin, 1998). Attention – Deficit / Hyperactivity Disorder (ADHD) is a disorder that interferes with social, academic and occupational functioning. Inattention symptoms include failure to give close attention to details, difficulty sustaining attention, distraction by extraneous stimuli and forgetfulness. Hyperactive – impulsive symptoms are more observable and include fidgeting, running about, blurtting answers and interrupting (Seligman, 1998).

ADHD is one of the most common reasons for referring children to psychiatric and mental health agencies and is the most common neurobehavioural disorder of childhood (Teeter, 1998). It is estimated that between 15 and 20% of children and adolescents experience behavioural disorders (Wicks-Nelson & Isreal, 2006). Estimates indicate that between 6 and 15% of school-aged children in North America suffer from ADHD (Litner & Ostiguy, 2000). This comprises both a significant portion of the school population and a high proportion of the children estimated to have behavioural disorders. Studies have shown that 80% of children diagnosed with ADHD retain the disorder into adolescence and up to 65% continue to show effects of the disorder into adulthood (Flick, 1998). Adolescents with ADHD exhibit low self-esteem, low self-confidence and poor self-concept, all contributing to diminished motivation to complete school with 35% quitting before completion (Flick, 1998). Understanding this disorder and developing effective treatment strategies would generate broad benefits for society as a whole by increasing the quality of life of the people living with ADHD. This in turn, would improve the likelihood of these individuals completing their education and making a greater contribution to the productivity of society.

There are a variety of theories about the basis of ADHD and a wide range of approaches used to deal with the disorder. The major theories related to the underlying cause of ADHD include attitudinal, such as lack of motivation, and biological, such as lack of working memory and time sense. Treatment approaches include behavioural, such as self-regulation, and medicinal, such as psychostimulants, as well as combinations of the two.

A recent behavioural approach that has promise is a motivational strategy based on self-regulation (Reid, Trout, & Schartz, 2005). This thesis explores, through a case study, the effectiveness of a treatment strategy that involves the individual with ADHD in the selection and control of the treatment in order to generate self-motivation. The rationale for this approach is that the self-motivation produced by participating in the choice of the rewards earned in a token economy will generate self-regulation and in turn, lead to a reduction in problem behaviours. One of the reasons the token economy system was chosen as a treatment methodology was because, this behaviour modification strategy makes it easy for the student to participate in designing the program. The purpose of this thesis is to evaluate whether using client participation to increase self-motivation as part of the treatment strategy can generate a 50% reduction in target behaviours in an adolescent student in a classroom environment. Two separate target behaviours were selected with the assistance of the Student Support Center supervisor and by direct observation. The literature reviewed for this thesis focuses on theories and treatment strategies dealing with ADHD in a school setting.
Chapter II: Literature Review

Literature from two areas of research was reviewed in order to develop a strategy for the case study and treatment program. The first area consisted of studies that described the characteristics of ADHD. The second area consisted of treatment methodologies and their effectiveness.

Characteristics of ADHD

Three studies on the characteristics of ADHD were reviewed. Stevens, Quittner, Zuckerman and Moore (2002) reviewed three aspects of the Barkley (1997) model on ADHD, which in turn views the central issue of ADHD as behavioural inhibition. McInerney & Kerns (2003) examined the issue of subjective time sense in children with ADHD. Carlson, Booth, Shin & Canu (2002) focused on motivational deficiencies in the Combined and Inattentive subtypes of ADHD as defined by the DSM-IV.

Barkley (1997) presented a model that suggests that behavioural inhibition is a central problem of ADHD and that this inhibition comes from four deficient processes. These being: working memory; self-regulation of affect, motivation and arousal; internalization of speech; and reconstitution. Stevens et al. (2002) performed neuropsychological research on 76 children with ADHD to examine three aspects of the Barkley (1997) model of ADHD. Stevens et al. examined working memory, self-regulation, motivation and behavioural inhibition.

In the area of working memory, Stevens et al. (2002) indicate that prior to their study research was based on verbal and mathematical tests that required subject based skills. The student’s skill level in the specific subject influenced the results. The authors choose to deal with this problem by implementing a Coloured Number Test developed by Hale and Associates in 1996. The Coloured Number Test involves displaying a sequence of coloured numbers ranging in length from two to nine digits. Children were asked to recall both the digits and their sequence. The testing continued until the child provided an incorrect response on two consecutive trials at any given level.

In the area of behavioural inhibition, work done on impulsivity prior to the study was conducted with the Antisaccade Task¹, the Continuous Performance Task² and the Wisconsin Card Sorting Test³. Limitations of these tests include a possibility of inadvertently measuring aversion to long delays, lack of motivation or inconsistency in instruction delivery due to the intricacy of these procedures. The author justifies using the Stop-Signal Task developed by Logan and Cowan in 1984, in order to deal with these concerns and generate more meaningful results. The Stop-Signal Task is a computer-based test that involves pressing a key on a game pad to mimic the image displayed on the computer screen. An audio signal is used to instruct the participant to not press the game pad key. Not pressing the key when the signal is heard is the correct response.

Results indicated that children with ADHD had deficits in inhibitory control, working memory and short-term memory. Results in the Stevens et al. (2002) study contradict the idea that deficits faced by children with ADHD are only related to an inability to self-regulate. Three clinical implications arose from the study. The first implication is that external cues may be necessary to deal with poor inhibitory control. The second implication is that different

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¹ The Antisaccade Task is a measure of volitional control of behavior sensitive to fronto-striatal dysfunction (Hutton & Ettinger, 2006)
² A Continuous Performance Task is a psychological test that consists of a series of stimuli. It is often used as part of a battery of tests to try to understand a person's capacity to sort and manage information (www.wikipedia.com)
³ The Wisconsin Card Sorting Test is a neuropsychological test of "set-shifting", i.e. the ability to display flexibility in the face of changing schedules of reinforcement (www.wikipedia.com)
educational strategies are needed to be developed to deal with major deficits in working memory. The third implication is that an ADHD child’s lack of awareness of their poor performance inhibits their ability to self-correct.

A study conducted by McInerney & Kerns (2003) evaluated whether children with ADHD have a deficit in subjective time sense rather than an impairment of motivation. From their review of the literature, the authors found that children with ADHD perform poorly on a variety of measures of the subjective sense of time. It was noted that many of these measures offer little reinforcement or incentive to perform well. The authors found consensus among researchers that deficits in behavioural inhibition is fundamental in ADHD. The authors referenced Barkley’s model of executive functioning which states that the four executive functions of spatial working memory, verbal working memory, self-regulation and reconstitution exist in subordination to behavioural inhibition. In addition, Barkley suggests that deficient behavioural inhibition interferes with executive functions. This creates a situation in which a person cannot think before they act. In their review of the literature, McInerney & Kerns (2003) suggest that research indicates that deficient working memory leads to a poor subjective sense of time. It was noted that the way children perceive time changes over the course of development. The article further references research by Oosterlaan and Sergeant (1998) that shows children with ADHD have dissimilar motivational sets compared to non-ADHD children. Oosterlaan and Sergeant discuss two main streams of research. The first suggests that children with ADHD do not put out the necessary effort to perform well. The second line of research suggests that performance is most heavily influenced by rewards. McInerney & Kerns (2003) cited Douglas and Parry (1994) who found that children with ADHD are unusually sensitive to rewards. Their overall conclusion was that children with ADHD only benefit from rewards that are delivered consistently. Their results indicated that children with ADHD have a true time sense impairment and that enhanced motivation may be used to partially correct this deficiency. Results further indicated that the outcome is influenced by the degree of motivation. Three clinical implications were identified. The first is that even a small amount of motivational enhancement significantly improves the behaviour. The second is that in assessing a child with ADHD the degree of motivation towards a task being measured can have a significant influence on performance and thus the assessment results. Third, a deficient time sense may be a characteristic of ADHD that cannot be completely overcome by motivation.

Carlson et al. (2002) reviewed motivational styles in two of the three ADHD subtypes as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). The subtypes selected were Combined and Inattentive. No other study has directly assessed the motivational style in children with the Inattentive subtype. However, early work in conjunction with the DSM III (American Association, 1980) subtype Attention Deficit Disorder-Without Hyperactivity indicates that this group has a cognitive-behavioural style of passivity and lethargy. The authors did not report on the Hyperactive subtype. Carlson et al. hypothesized that both subtypes would show motivational problems but that the nature of the deficits might differ based on symptom patterns and related characteristics. Their study was conducted using four questionnaires and a computer-based measure of attention.

4 The Combined ADHD subtype consists of six or more symptoms listed in the DSM-IV for psychiatric disorders in both hyperactivity and inattention. This is the most common and severe type. (http://ezinearticles.com/?ADHD-Combined-Type-Disorder&id=216654)

5 The Inattentive ADHD subtype consists of ADHD-I is different from the other subtypes of ADHD in that it is characterized by inattention, daydreaming and lethargy, but with little to none of the hyperactivity, impulsiveness or conduct disorders typical of the other three ADHD subtypes. (www.wikipedia.org)
Three of the questionnaires were completed by the children and the fourth was completed by the child’s teacher. The children completed the Children’s Academic Intrinsic Motivation Inventory (CAIMI; Gottfried, 1986), the How I Feel About School Questionnaire (HIFAS; Schunk, 1996) and the Intrinsic Versus Extrinsic Orientation in the Classroom (Harter, 1981). The teachers completed the Teacher Rating of Academic Achievement Motivation (TRAAM; Stinnett & Oehler-Stinnett, 1992).

Results of Carlson et al.’s (2002) study indicated that both subtypes had motivational impairments in preference for easy work, less enjoyment of learning, less persistence and a heavy reliance on external standards, rather than their own internal standards, when judging their own performance. These results remained valid even when co-varied with intelligence ratings indicating a contribution of motivational factors to poor academic performance in children with ADHD. Differences were found in the motivational styles of children with ADHD/Combined and ADHD/Inattentive. Children with ADHD/Combined are more competitive and are motivated by a desire to be perceived as superior to others. They also are characterized by a tendency to externalize problems and to impulsivity. Children with ADHD/Inattentive are more passive in their approach to school work, relying more heavily on external validation than on internal drive. These children are more lethargic in their mental style. The authors concluded that the difference in motivational styles could be used to plan intervention strategies. The more competitive style of children with ADHD/Combined could respond well to game-like learning approaches combined with public recognition of performance. Children with ADHD/Inattentive could be motivated with cooperative learning strategies combined with enhanced systems for external feedback.

**Treatments for ADHD**

Ten studies examining a variety of treatment methodologies were analyzed with the objective of selecting an effective treatment strategy for the case study. Miranda, Jarque and Tarraga (2006) indicated that the two primary forms of intervention with ADHD children were behaviour modification and medicinal intervention. They highlighted some of the disadvantages of medicinal intervention as a sole treatment option. They then proposed a variety of psychosocial interventions. An overview by Barkley (1993) provided eight general principles for working with children with ADHD. Reid, Trout and Schartz (2005) studied the effectiveness of four different self-regulation processes in the treatment of ADHD. Kazdin and Bootzin (1972) provided insight into the use of token economies as a treatment strategy. Carlson and Tamm (2000) examined the effects of reward and response cost in assisting with ADHD behavioural issues. Flood, Wilder, Flood and Masuda (2002) evaluated the effect of using peer-mediated reinforcement as a methodology for treating ADHD. Two studies, one by Powell and Nelson (1997) and the other by Romanik, Miltenberger, Conyers, Jenner, Jurgens and Ringenberg (2002), used the choice of academic assignment as a means to increase motivation. Work done by Aase and Sagvolden (2006) studied the use of reinforcement frequency on the treatment outcome when assisting children with ADHD. Finally, Friman and Poling (1995) reviewed the effect of physical response effort as a way to modify ADHD behaviour. Details of all of these studies form the balance of the literature review.

In an overview on interventions in school settings for students with ADHD, Miranda, Jarque and Tarraga (2006) indicated that a wide variety of treatments have been used to work with children with ADHD. These include traditional therapy, restrictive or supplemental diets, biofeedback, allergy treatments, perceptual motor training and play therapy and are presented in three types in the empirical literature. These are central nervous system stimulants, behaviour
modification and a combination of the two. Pharmacological intervention using psychostimulants, improve daily classroom performance and reduce disruptive behaviour. However, psychostimulants fail to produce long term changes in overall academic performance, do not produce changes in interpersonal relationships, nor do they improve the long term ADHD prognosis. As well, this approach only works with 70-80% of the children. Complementary support using interventions of a psychosocial nature is required to overcome the limitations of pharmacological interventions. Development of appropriate self control mechanisms occurs at home and at school in a complex network of social interactions. Studies show that interventions that produce benefits at home, such as family therapy, individual therapy and parent training do not generalize into a school environment (Miranda, Jarque, & Tarraga, 2006). As a result responsibility for effective school-based interventions remains with the school. The authors discuss the special educational needs of children with ADHD. They suggest that the academic and behavioural problems of children with ADHD are predominantly a self-regulation problem. This problem includes three components: an intentional component, an inhibitory component and an organizational component. The authors reported that students with ADHD fail at learning tasks that require attention, inhibition and active involvement. They also fail at tasks that require organizational capabilities. This is due to their ineffective use of such processes as working memory, working fluently, being alert and monitoring their work. They also experience social rejection from their peers due to deficits in self regulation of affect, an inability to use everyday communicative language and a tendency to display disruptive and antisocial behaviour.

Miranda, Jarque and Tarraga (2006) reviewed sixteen studies and organized them into two categories: simple interventions and multiple-component interventions. Simple interventions consisted of behaviour modification techniques, cognitive-behavioural techniques and environmental changes. In the interventions with multiple-components, behavioural or cognitive-behavioural techniques were combined with interventions, such as counselling, social skills training or study skills training. The majority of the interventions were based on combining several procedures such as, token economy, extinction, response cost and time-out, self-instruction, reinforced self-evaluation, training in social abilities, assessment for parents and teachers, training in study skills and instructional management procedures. The authors noted that in general, all of the interventions show positive results. The authors concluded that the most effective treatment for ADHD is a multi-faceted intervention that includes medication, parent training, school intervention and child intervention. They also stated that self-evaluation decreases disruptive behaviour in students with ADHD. Finally, they concluded that their review showed the effectiveness of multiple-component behavioural therapy packages that included training on self-instruction, problem solving and social skills.

Barkley (1993) developed eight general principles to be used to guide ADHD children. These principles are derived from the then current conceptual model that ADHD is a biological deficit in persistence of effort, inhibition and motivation. As well, the author was influenced by the theory that ADHD involves a reduced sensitivity to behavioural consequences, such as rewards and punishments. The eight principles are: 1) to use more immediate consequences, 2) to use a greater frequency of consequences, 3) to employ more salient consequences, 4) to start incentives before punishments, 5) to strive for consistency, 6) to plan for problem situations and transitions, 7) to keep a disability perspective and 8) to practice forgiveness. In the article, Barkley (1993) describes the rationale behind these principles and suggestions for effective implementation.
For the principle of immediate consequences, Barkley (1993) suggests that ADHD children require more immediate feedback for their behaviour than do non-ADHD children. ADHD children also seem less rule-governed and more contingency shaped in daily situations than their peers. It is therefore necessary that feedback be clear, specific and timed to occur closely to the occurrence of the target behaviour. The more immediately that feedback is provided, the more effective it will be.

For the principle of greater frequency of consequences, Barkley (1993) proposes that children with ADHD require exposure to behavioural consequences more frequently than non-ADHD children. It is therefore important to let ADHD children know more frequently how they are doing with respect to their behaviour.

For salient consequences, Barkley (1993) makes the point that ADHD children require stronger consequences than normal children in order to achieve motivation to perform work, follow rules or behave appropriately. He further explains that insensitivity to rewards or consequences explains why verbal praise alone does not motivate ADHD children and that material rewards are often necessary to achieve motivation.

In the principle of using incentives before punishments, Barkley (1993) emphasizes that this principle must be reinforced consistently by the caregivers. As well, caregivers must cultivate a habit of redefining problem behaviours in terms of positive alternatives. He also recommends using a small amount of mild punishment interspersed with an incentive program as an effective means to bring about change and achieve desired behaviours.

In striving for consistency, Barkley (1993) emphasizes that there are three important areas requiring attention. First, caregivers need to be consistent over time. Second, they need to be consistent across settings. Third, where there are multiple caregivers, they need to be consistent with each other.

In the principle of planning for problem situations, Barkley (1993) indicates that caregivers of ADHD children frequently are faced with difficult, disruptive or non-compliant behaviour. He suggests that caregivers anticipate problem situations, consider in advance how to deal with them, develop a plan, share the plan with the child and use the plan should a problem arise. The strategy of sharing the plan with the child greatly reduces the likelihood that the event will occur.

For the principle of keeping a disability perspective, Barkley (1993) advises that it is important for the caregiver to maintain a psychological distance from a child’s disruptive behaviour. Furthermore, it is desirable to stay calm and maintain a sense of humour. It is very important that caregivers not personalize the problem encountered with the child. This position can be attained by the caregiver maintaining the perspective that they are working with an intellectually disabled child.

Finally, to practice forgiveness, Barkley (1993) developed a three part approach. The first area of forgiveness for the caregivers is to forgive the children for their transgressions. The second area is to forgive others that have misunderstood the child’s inappropriate behaviour and have acted in ways that were offensive to either the caregiver or the child. Third, caregivers must practice forgiveness of themselves for their own mistakes in managing a child’s behaviour. Forgiveness in all three areas must be practiced on a daily basis at a time outside the care-giving period.

**Self-Regulation**

In a meta-analysis, Reid, Trout & Schartz (2005) reviewed the literature on four different types of self-regulation used to treat children with ADHD. Self-regulation refers to a variety of
methods used by students to manage, monitor, record and assess their behaviour or academic achievement. The process is used to decrease negative behaviours and increase positive target behaviours. Teaching self-regulation has been successful with children with learning disabilities, behaviour disorders and intellectual disabilities. An important aspect of self-regulation is a conscious appraisal of immediate past behaviour. A critical factor in self-regulation for children with ADHD is to use more feedback and use that feedback more often. The four self-regulation processes that were reviewed were self-monitoring, self-monitoring plus reinforcement, self-reinforcement and self-management. Self-monitoring is a multi-component process that involves observing and recording one’s own behaviour. The person doing the self-monitoring first must determine the occurrence of the target response and then self-record some aspect of that response. Self-recording constitutes an immediate consequence. Two common forms of self-monitoring are: self-monitoring of attention and self-monitoring of performance. Monitoring for attention often involves the use of a prompt. Monitoring of performance often involves the use of a graph. Self-monitoring plus reinforcement involves the same steps as self-monitoring; however, in addition the child is awarded an external reinforcement as a reward for achieving the target behaviour. The purpose of this combination is to increase the salience of the self-assessment. Self-reinforcement involves the same process as self-monitoring plus reinforcement; however, the student is responsible for providing their own reward. The self-administered reinforcer often takes the form of tokens or points, which are later redeemed. The reinforcers provide a record of student performance. Self-management requires that the student monitor, rate and then compare their behaviour to an external standard. The student’s rating is compared to an evaluation done by an observer, such as a teacher. The student is then awarded the reinforcer when their evaluations match those of the observer. The authors note that children with ADHD often possess the requisite skills for desired behaviours but experience difficulties with consistency because of problems with self-regulation. The study results indicate that self-regulation interventions can improve on-task behaviour, academic productivity and disruptive behaviour. The authors concluded that self-regulation interventions were effective for treating ADHD. There was insufficient study data to determine if differences in the four types of self-regulation were statistically significant.

**Token Economies**

Kazdin and Bootzin (1972) conducted a review of token economies in a variety of settings, including classroom applications. They concluded that token economies had a number of useful features. The token provides a generalized conditioned reinforcer that can later be substituted for a specific reinforcer at a convenient time. The token bridges the delay between the target response and the application of the backup reinforcement. The token permits reinforcement to be employed any time. The token may be used over extended time frames as a substitute for the backup reinforcer. Use of the token allows a normal sequence of responses to be reinforced without interrupting a response sequence.

Additional studies were reviewed on the effects of reward and response cost (Carlson & Tamm, 2000); peer-mediated reinforcement and prompting (Flood, Wilder, Flood, & Masuda, 2002); choice of academic assignments (Powell & Nelson, 1997) (Romaniuk, Miltenberger, Conyers, Jenner, Jurgens, & Ringenberg, 2002); reinforcement frequency (Aase & Sagvolden, 2006); and response effort (Friman & Poling, 1995). Each of these provided information that will supplement the main thesis.

Carlson and Tamm (2000) examined the effects of reward, response cost and no contingency using a combination of both high and low interest tasks. Response cost involves
using a negative sanction to deter the participant from engaging in a particular behaviour. The authors conclude that although high response cost had the greatest benefit on performance, it decreased self-rated performance and motivation relative to use of a reward for performing a low-interest task. As well, ADHD children performed comparatively better on high-interest tasks.

Flood, Wilder, Flood, and Masuda (2002) studied the effect of using peer-mediated reinforcement plus prompting to reduce off-task behaviour in a simulated classroom environment. The results of the study were that the use of peer-mediated reinforcement reduced off-task behaviour and increased work completion when compared to baseline conditions.

Powell and Nelson (1997) studied the effect of providing the choice in academic assignments as a means of reducing undesirable behaviour. The study demonstrated that undesirable behaviour was reduced when a choice of tasks was used as an antecedent control.

Romaniuk, Miltenerger, Conyers, Jenner, Jurgens, and Ringenberg (2002) studied the effect of assignment choice on two groups of students. The first group were students who displayed escape-maintained problem behaviour. The second group were students who displayed attention-maintained problem behaviour. The choice of assignments had a positive effect in reducing problem behaviour in the escape-maintained group. The attention-maintained group did not show any improvement.

Aase and Sagvolden (2006) evaluated the effect of reinforcement frequency on hyperactivity, impulsiveness, sustained attention, and response variability. No difference between children with ADHD and controls were found when reinforcement was given frequently. Differences were recorded for sustained attention and variability when reinforcement was infrequent.

Friman and Poling (1995) summarised studies on the effect of increasing the physical response effort required to perform a task on reducing the frequency of occurrence of the response. A difficulty with ADHD students can be a high-rate of switching from one task to another. A response cost intervention to this situation would be to insist that the student perform a particular task each time an unwanted switch took place. The inconvenience of performing the mandated switching task has been demonstrated to reduce the initial unwanted switching behaviour. The authors concluded that increasing response effort reduced the occurrence of undesirable behaviours. They also concluded that further study in this area was warranted.

In summary, the literature supports the thesis that client involvement in generating self-motivation is an effective component in ADHD treatment. The conceptual model developed by Barkley (1993) combined with the work by Carlson et al. (2002) on motivational deficiencies; provide a framework for understanding the characteristics of children with ADHD. The principles provided by Barkley (1993), research by Reid et al. (2005) on self-regulation and research by Powell and Nelson (1997) on the motivation provided by choice of academic assignment indicates that a strategy combining effective features of their work could prove effective in treating ADHD behavioural issues. This case study focuses on using a token economy system based on choice of reward by the child with ADHD as a means of increasing self-regulation and self-motivation. The hypothesis is that this strategy will prove to be an effective means of reducing problem behaviours associated with ADHD.
Chapter III: Methodology

**Participant Selection Process**

The students being assisted at the Student Support Center of a local Kingston elementary school were directly observed in a classroom setting to determine which of the students were the most appropriate to participate in the case study. The criteria for selecting a student were that the student had a diagnosis of ADHD and was exhibiting disruptive behaviour. Following the observation period, a short list of appropriate students was created. The students on the short list were discussed with the Support Center supervisor and consensus was reached on the single, most suitable candidate to participate. The student selected met the selection criteria for the case study. The student was a grade eight male diagnosed with ADHD. Consent was sought and received from the parents of the selected student prior to collecting observational baseline data in the school environment using the Parent Consent Form (Appendix A). Following the collection of baseline data, the selected student was approached and their consent to participate in the treatment portion of the case study was sought. The first student selected agreed to participate in the case study. If the selected student had declined, the same process would have been followed with the next most suitable student on the short list.

**Design**

The case study was performed using an AB design consisting of a baseline data collection period followed by a treatment period. The program consisted of involving the student and the student’s support worker in planning and executing a token economy program designed to improve the student’s in-class performance. The independent variable was intervals of instructional time. The dependent variable was incidents of occurrence of the target behaviours per interval of instruction. Appendix B includes raw data for the baseline period.

**Setting**

An elementary school in the Kingston, Ontario area was selected as the location to conduct a behavioural treatment program. The school is one of two in the Kingston area to have a Student Support Center. The purpose of the Student Support Center is to provide emotional and academic support to a select group of students with behavioural difficulties. The nature of the support consisted of such things as daily homework checks, daily written communication with parents and maintenance of daily journals on student behaviour.

Preliminary evaluation during participant selection was conducted in two intermediate classrooms. The classroom in which the case study was performed was a grade eight classroom with 22 students. In addition to the teacher, classroom support consisted of an Educational Assistant and a Student Support worker. Two different support workers shared coverage of the school day. One Support worker was present in the morning and another in the afternoon.

**Dependent Variables**

There were two target behaviours that function as dependent variables. The first target behaviour was decreasing off-task behaviour. Off-task behaviour was deemed to begin when the student was not engaged in assigned work. Off-task behaviour was deemed to include distracting other students, talking out and not focusing on assigned tasks. Off-task behaviour ended when the student was engaged in such behaviours as focusing on school work, being attentive and not distracting other students. The second target behaviour was decreasing non-compliant behaviour. Non-compliant behaviour began when the student disregarded an existing
classroom rule or a direct request from a person in authority. Non-compliant behaviour ended when the student obeyed a rule or a request.

Both dependent variables represent measuring the incident that occurs least frequently over an interval from elapsed instructional time. The converse of measuring increased on-task behaviour would involve measuring the interval between off-task behaviours. For simplicity, measuring off-task behaviour was selected. Elapsed time between incidents was selected as one mode of data interpretation.

**Measures**

The following measures were used to collect data during the case study.

*Measures of Observers*

1.) An Unstructured Interview with the Support Worker (Appendix C)

*Measures of Subject Characteristics*

1.) Functional Assessment Observation Form (Appendix D)
2.) Sequence (ABC) Analysis of Baseline Data (Appendix E)
3.) Interview with Participant (Appendix F)
4.) Incentive Survey with Participant (Appendix G)

*Measures of Dependent Variables*

1.) Daily Data Collection Table (sample day of baseline can be seen in Appendix B)

**Procedure**

Preliminary interviews were held with the support worker in order to explain the program and her role, as well as to discuss integrating this program with existing school programs. Verbal instructions were used to inform the support worker about her role in executing the program. Feedback from the support worker was used to assist with the final selection of the participant. Parental consent of the selected student was obtained prior to selecting target behaviours or collecting baseline data. Following the selection, information was collected during an unstructured interview with the support worker in order to choose the target behaviours. The first target behaviour selected was decreasing off-task behaviour. The second target behaviour selected was decreasing non-compliant behaviour. A baseline observation period of seven school days was used to gather data on the pre-program behaviours of the student in each of the target behaviour areas. Event recording during ten-minute intervals was used for the duration of the case study to collect data on the target behaviours. During the baseline period, a Functional Assessment Observation Form (O’Neill, 1997) was used to collect data on predictors, perceived functions and consequences. A Sequence (ABC) Analysis of Baseline Data was completed using a Contingency Analysis Chart (Sulzer-Azaroff & Mayer, 1991) in order to determine the antecedents and consequences of the behaviours exhibited. Following the baseline period the selected student was approached to determine their willingness to participate in the program. At this point the features of the token economy system were discussed with the student. Upon receiving the student’s verbal consent, the student was asked to complete an incentive survey to assist with determining the rewards of the token economy system. Thus, the token economy was designed with direct input from the student who chose a self-motivation factor. The token economy system that was used consisted of a sticker chart with laid out time periods (Appendix H). The expectations, as well as the criteria for the reward system, were clearly described to the student (Appendix I). The student earned a sticker when the appropriate
behaviours were exhibited, which was placed on the Weekly Reward Sticker Chart. At the end of the week the student, with supervision, divided the number of stickers obtained by the number of stickers available and got a percentage. The student then received a reward based on the percentage.

The treatment phase of the program was designed to reach pre-determined behaviour goals within an eleven-week active treatment period. Data was gathered during the treatment period. Subjective feedback from the student’s support worker was also used to assess the student’s progress.
Chapter IV: Results

Data were collected on off-task behaviour and non-compliant behaviour during both a baseline period and a treatment period. Data were recorded as incidents per ten-minute interval of instruction time. The baseline period consisted of seven days and a total of 24 hours of instructional time. Of the total instruction time, 14.83 hours was in the morning and 9.17 hours was in the afternoon. The treatment period consisted of 48 days and a total of 240.5 hours of instruction. Of these 123.17 hours were in the morning and 117.33 hours were in the afternoon.

Data were analyzed in two ways to determine the results of the treatment. First, information was compiled on the number of incidents per instructional hour for each of the two target behaviours, as well as for the total number of incidents for both behaviours. Second, information was compiled on the elapsed intervals between incidents for each of the target behaviours.

During the baseline period, a total of 79 incidents were observed. Of these, 41 were off-task behaviour and 38 were non-compliant behaviour. During the treatment period, a total of 76 incidents were observed. These consisted of 27 off-task behaviours and 49 non-compliant behaviours. Figure 1 indicates the distribution of total incidents during both the baseline and treatment periods.

Figure 1: Baseline vs. Treatment - Incidents
The total incidents per instructional hour during the baseline period were 3.3. The total incidents per instructional hour during the treatment period were 0.3. Expressed as a percentage, the incidents per instructional hour during the treatment period were 9.6% of those in the baseline period. This represents a total reduction of incidents per instructional hour of 90.4% during the treatment period.

When the data for off-task and non-compliant behaviours were analyzed separately, slight differences in the effectiveness of the treatment were observed. The results for off-task behaviour are summarized in Table 1. Table 2 summarizes the results for non-compliant behaviour.

**Table 1: Summary of Baseline and Treatment Results for Off-Task Behaviour**

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Period</th>
<th>Total Incidents</th>
<th>Incidents Per Hour Of Instruction</th>
<th>% Treatment of Baseline</th>
<th>% Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-Task</td>
<td>Baseline AM</td>
<td>21</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baseline PM</td>
<td>20</td>
<td>2.2</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Baseline Total</td>
<td>41</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off-Task</td>
<td>Treatment AM</td>
<td>15</td>
<td>0.1</td>
<td>8.6</td>
<td>91.4</td>
</tr>
<tr>
<td></td>
<td>Treatment PM</td>
<td>12</td>
<td>0.1</td>
<td>4.7</td>
<td>95.3</td>
</tr>
<tr>
<td></td>
<td>Treatment Total</td>
<td>27</td>
<td>0.1</td>
<td>6.7</td>
<td>93.4</td>
</tr>
</tbody>
</table>

For off-task behaviour, the incidents per instructional hour during the baseline period were 1.7. During the treatment period, the incidents per instructional hour were 0.1. As a percentage, treatment results were 6.7% of baseline results. This represents a 93.4% reduction in off-task behaviour. These results were slightly better than the total off-task incidents which showed a 90.4% reduction. During the baseline period, the highest rate of occurrence of off-task incidents was in the afternoon. During the treatment period, the highest rate of occurrence of off-task incidents was in the morning. The greatest improvement occurred in the afternoon results, with a percent reduction of 95.3%. More total off-task incidents occurred in the morning during both the baseline and treatment periods; however, the number of instructional hours was also greater in the morning. The off-task treatment total of 27 incidents represents 64% of the total incidents during the treatment period.
Table 2: Summary of Baseline and Treatment Results for Non-Compliant Behaviour

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Period</th>
<th>Total Incidents</th>
<th>Incidents Per Hour Of Instruction</th>
<th>% Treatment of Baseline</th>
<th>% Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Compliant</td>
<td>Baseline AM</td>
<td>22</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baseline PM</td>
<td>16</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Baseline Total</td>
<td>38</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Compliant</td>
<td>Treatment AM</td>
<td>29</td>
<td>0.2</td>
<td>15.9</td>
<td>84.1</td>
</tr>
<tr>
<td></td>
<td>Treatment PM</td>
<td>20</td>
<td>0.2</td>
<td>9.8</td>
<td>90.2</td>
</tr>
<tr>
<td></td>
<td>Treatment Total</td>
<td>49</td>
<td>0.2</td>
<td>12.9</td>
<td>87.1</td>
</tr>
</tbody>
</table>

For non-compliant behaviour, the incidents per instructional hour during the baseline period were 1.6. During the treatment period, the incidents per instructional hour were 0.2. As a percentage, treatment results were 12.9% of baseline results. This represents an 87.1% reduction in non-compliant behaviour. These results were slightly lower than the total results which showed a 90.4% reduction. During the baseline period, the highest rate of occurrence was in the afternoon. During the treatment period, the highest rate of occurrence was in the morning. The greatest improvement occurred in the afternoon results, with a percent reduction of 90.2%. More total incidents occurred in the morning during both the baseline and treatment periods; however, the number of instructional hours was also greater in the morning. The non-compliant treatment total of 49 incidents represents 36% of the total incidents during the treatment period.

The results for the elapsed intervals evaluation for off-task and non-compliant behaviours are shown in Figures 2 and 3 respectively. Each point on these graphs represents a five-day average for elapsed intervals between incidents of target behaviour. Each graph also displays results for both the baseline and treatment periods. For both behaviours, a period average for the entire baseline and treatment periods was also calculated.
For off-task behaviour, the average elapsed interval between incidents during the baseline period was 3.5 intervals. For the treatment period, the average elapsed interval between incidents was 51.3 intervals. The percent improvement in results from the baseline period to the treatment period was 1475%.

The shortest elapsed interval between incidents during the baseline period was 0.3 intervals. The shortest elapsed interval between incidents during the treatment period was 0.5 intervals. The longest elapsed interval between incidents during the baseline period was 12. The longest elapsed interval between incidents during the treatment period was 525.

The range in elapsed intervals between incidents during the baseline period was 0.3 to 12 intervals, for a total range of 11.7 intervals. The range in elapsed intervals between incidents during the treatment period was 0.5 to 525 intervals, for a total range of 524.5 intervals for an improvement of 4494%. From Figure 2 it can be seen that the elapsed intervals between incidents increases steadily during the treatment period.

For non-compliant behaviour, the average elapsed interval between incidents during the baseline period was 4.0 intervals. For the treatment period, the average elapsed interval between incidents was 27.9 intervals. The percent improvement in results from the baseline period to the treatment period was 694%.

The shortest elapsed interval between incidents during the baseline period was 0.5 intervals. The longest elapsed interval between incidents during the baseline period was 24. The range in elapsed intervals between incidents during the baseline period was 0.5 to 24 intervals, for a total range of 23.5 intervals.

The shortest elapsed interval between incidents during the treatment period was 0.5 intervals. The longest elapsed interval between incidents during the treatment period was 543. The range in elapsed intervals between incidents during the treatment period was 0.5 to 543 intervals, for a total range of 542.5 intervals for an improvement of 2308%.

During the baseline period off-task behaviour was also a greater issue than non-compliant behaviour as the incidents per instructional hour for off-task behaviour during the baseline period was 1.7, whereas the incidents per instructional hour for non-compliant behaviour was 1.6. The
average incidents per instructional hour for off-task behaviour during the treatment period was 0.1. For non-compliant behaviour the average during the treatment period was 0.2.

From Figure 3 it can be seen that the elapsed intervals between incidents increases during the treatment period. There appears to be an anomaly in the data near the end of the treatment period between days 25-35. The anomaly in the data can be explained by the fact that when there is a lapse in target behaviour, there tends to be several incidents in close proximity to one another. Two such occurrences took place in the final month of the program, influencing the latter part of the results.
Chapter V: Discussion

Discussion of Results

In general, the results indicate that a treatment program containing a self-motivation element as a component of a token economy system was very effective. Data were analyzed with respect to number of incidents per instructional hour and elapsed intervals between incidents for each of the target behaviours. Both ways of analyzing data showed significant improvement on both target behaviours when results from the baseline period were compared to results for the treatment period.

When results are analysed for each of the target behaviours there was a greater reduction in incidents per instructional hour for off-task behaviour than for non-compliant behaviour. As well the percent change in the total range of elapsed intervals was greater for off-task behaviours than for non-compliant behaviour. This is predominantly due to the fact that during the baseline period the range of elapsed intervals for non-compliant behaviour was roughly twice that of off-task behaviour. Both baseline elapsed intervals were relatively small compared to the elapsed intervals in the treatment period. The longest elapsed interval without an incident during the treatment period was for non-compliant behaviour.

The overall improvement for off-task behaviour was greater than the improvement for non-compliant behaviour. During the baseline period off-task behaviour was also a greater issue than non-compliant behaviour as the incidents per instructional hour for off-task behaviour during the baseline period was approximately 10% greater than those for non-compliant behaviour. Conversely the average incidents per instructional hour for off-task behaviour during the treatment period was approximately half those for non-compliant behaviour. The relative difference between the treatment results is far greater than the initial difference in the baseline behaviours. The largest issue was the lesser issue by the end of the treatment period.

The work in this case study focused on using a token economy system based on choice of reward by the child with ADHD as a means of increasing self-regulation and self-motivation. The hypothesis was that this strategy would prove effective as a means of reducing problem behaviours associated with ADHD. The standard for a positive outcome was that the target behaviours be reduced by at least 50%. The results of the study confirm the hypothesis.

The results were achieved by combining features from previously published work that had generated positive outcomes into the behaviour modification program. The study by Kazdin and Bootzin (1972) indicated the benefits and effectiveness of token economy systems in a classroom environment. The work by Douglas, Parry (1994) concluded that children with ADHD were particularly sensitive to reward. Carlson et al. (2000) concluded that performance was better in high interest tasks. Carlson et al. (2002) further concluded that children with combined ADHD tended to be competitive. They possessed a desire to appear superior. They also responded well to games and public recognition. Powell & Nelson (1997) concluded choice in academic tasks improved behaviour.

The behaviour modification tool selected for this case study was a specially configured Token Economy System. The token economy system incorporated the feature of reward. It was also structured as a game. The elements of high interest and choice were incorporated in that the rewards were selected by the student. One of the choices for reward was that notes from support staff acknowledging improved performance be forwarded to the student’s parent. This provided the feature of public recognition. In this way features that had proven effective in earlier work were in the behaviour modification program selected for this case study. The predominant element in all the features is that they incorporated personal preference.
From Figure 3 it can be seen that the elapsed intervals between incidents increases during the treatment period. There appears to be an anomaly in the data near the end of the treatment period between days 25-35. This is partly explained by the fact that when there is a lapse in target behaviour, there tends to be several incidents in close proximity to one another. Two such occurrences took place in the final month of the program, influencing the latter part of the results. There is no apparent reason for these groupings.

**Strengths**

Using self-motivation and support worker involvement to implement a behavioural approach to working with students with ADHD in a classroom environment has a number of advantages. The primary advantage is assisting the behaviour therapists to more efficiently gain the cooperation of the student, thus enabling them to work with a larger number of students simultaneously which makes better use of their available time. Another advantage is the effect on the overall classroom environment. When the target behaviours are being controlled effectively, there is less disruption in the classroom. This allows the teacher and class to focus more easily on the subject matter which in turn improves the learning environment. An improved learning environment would influence the academic performance of the entire class.

**Ethical Issues**

Ethical issues were addressed by assuring that appropriate parental and child consent was obtained prior to working with the student. Issues that were addressed included confidentiality, freedom from discrimination by teachers and peers, as well as personal privacy. The parent was informed on the right to withdraw their child from the program. The program was based on positive motivation and reinforcement. It did not contain any coercive elements which could harm the child. In order to further assure that the program did not contain any inadvertent negative elements that could possibly create a detrimental effect on the student; the program was reviewed by the Research Ethics Committee for Psychology (REC-P) at St. Lawrence College.

During implementation of the program, it was important to assure both the confidentiality of the program contents and freedom from peer discrimination directed towards the student that may have negatively influenced his self-esteem. In order to deal with this issue discussions were discreetly held with the student at locations and times when no other students were present. Interactions during class time were also discrete and time was shared with the class as a whole to ensure that the student was not centered out.

**Limitations**

The case study methodology contained four primary limitations that may affect the ability to generalize the results beyond the environment of the study. First, the case study was based on a single-subject design. This limits the ability to generalize the results to a larger population. Second, the program contained multiple components, all with an aspect of self-motivation such as a token economy system with participant selection of rewards. The design of the program was such that the individual components of the program were not isolated to determine the relationship of the component to the behavioural results of the program. Third, the program and the associated results were specific to the classroom environment and were not generalized across settings. Fourth, the target behaviours contained some overlap in their characteristics, such that non-compliant behaviour could be seen as being off-task.
Multilevel Challenges to Service Implementation

Challenges exist at four levels when implementing a behavioural change program in an educational setting. The four levels are: client, program, organizational and societal. The points below summarize the challenges encountered working with an ADHD student in an intermediate classroom.

At the client level there were five main challenges. The first challenge was to find a strategy that would appeal to the participant’s interests and ensure participation in the program. The second challenge was that the participant was sufficiently mature that his sense of independence made him confrontational and difficult to interact with at times. The third challenge was that the participant was subject to mood swings and at times was not interested in participating in the program. The fourth challenge was that on occasion the participant came to school tired due to lack of sleep. This had a negative influence on his behaviour by decreasing his attentiveness and increasing his non-compliance. The fifth challenge was that the participant had a tendency to resent authority figures which made it necessary to communicate in a non-confrontational manner.

At the program level there were two main challenges. The first challenge was that the number of students in the class made it difficult to interact closely with and observe the participant at all times. The second challenge was the need to maintain client anonymity during classroom hours. This made direct work with the client more difficult.

At the organizational level there were three main challenges. The first challenge was that there were a number of other students with behavioural issues in the classroom who provided inappropriate peer role models to the participant. The second challenge was that the nature of the learning environment with its focus on stationary learning methods, does not readily accommodate highly active individuals with kinaesthetic learning styles. The third challenge was that the Student Support Center at the school serves a valuable function, however the capacity of the Center is insufficient to handle the volume of support required by the student population.

At the societal level there were two main challenges. The first challenge was that relationships with family members and peers beyond the classroom created uncontrolled influences on the target behaviours that were part of the program. The second challenge was that turmoil in the family environment had a direct influence on the client’s in-school mood and behaviour.

Contribution to Behavioural Psychology Field

The results of the case study demonstrate that a token economy program, which contains an element of self-motivation, can generate significant positive improvement in target behaviours that would otherwise negatively influence a classroom environment. Assuming the program can be generalized across participants and classroom environments, the approach has the potential to improve the overall academic performance in a classroom setting when members of the class have behavioural issues related to ADHD.
Recommendations for Future Research

Recommendations for further research would expand upon the present case study in order to remove current limitations.

The first recommendation for further research would be to expand the case study into a multi-participant program. This would evaluate whether the results achieved in this study could be replicated across a number of participants in a variety of academic environments. The next recommendation would be to modify the program design in order to isolate the various components of self-motivation and token economy, and determine the influence of each component on the final results. Another recommendation for further research would be to generalize the study to include non-academic environments, such as home and peer-group settings. A final possible area of research would be to expand upon the work of Flood, Wilder, Flood and Masuda (2002). Flood et al. (2002) found that peer-mediated reinforcement reduced off-task behaviour and increased work completion of ADHD students in a simulated classroom environment. The use of this approach in a classroom setting, if demonstrated to be valid, could be a useful technique to reduce the necessary involvement of the teacher or support staff in implementing the program. Considering that there are high demands on the available classroom time of the teacher and support worker, an increase in the effectiveness of the approach and the ease of its application would also increase the willingness of both the support worker and the teacher to employ the strategy.
References


Appendix A: Parent Consent Form

PARENT CONSENT FORM

St. Lawrence College
100 Portsmouth Ave.
Kingston, Ontario K7L 5A6

Dear *,

September 12, 2007

Your child, *, has been selected to participate in a 14-week learning support program designed to enhance student success at school. The program is unique in that it will be tailored to your child, taking into account his strengths and needs. It will be based on observations of your child during the school day while he is participating in typical daily activities. Based on these observations, your child will be encouraged to develop and/or practice certain skills. This program will be integrated into your child’s regular schedule in a positive way and he will continue to participate in all classroom activities.

This program is being offered by Carolyn Ransom, a 4th year student in the 4-year Bachelor’s degree in Behavioural Psychology at St. Lawrence College, as part of a supervised placement experience. As part of her training so far, Ms. Ransom has taken courses in applied behaviour analysis, developmental psychology, childhood and adolescence, as well as in ethics, professional practice, and other areas. Ms. Ransom will be helping out in your child’s classroom on a daily basis from September 4th to December 7th, 2007. She will be working with your child’s teacher and will be supervised by Diane Nicholson, a faculty member at St. Lawrence College.

This opportunity is being offered to your child and the decision to participate is voluntary. If you wish your child to participate in this program, Ms. Ransom will work with your child individually and in groups. All information obtained about your child will be kept confidential and only your child’s teacher and principal will be informed of his participation. No information from this program will be included in any school report or documents. In the past, we have found that children benefit from this type of learning support program but there are no guarantees that every child will benefit. If you choose to participate, you have the right to withdraw at any time. If at any time, you have questions, comments or concerns about your child’s participation, please contact Diane Nicholson at dianeen@sympatico.ca

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Please sign the form on the next page, tear it off and return it as soon as possible to the school.
PARENT CONSENT FORM

I, ______________________ (print parents name), give permission for my child,
______________________ (print child’s name), to participate in a personalized learning support
program offered by Ms. Ransom at ________________________ (school’s name). I understand
that his participation is voluntary and that I may withdraw my consent at any time. If I have any
questions, I may contact Ms. Ransom’s college supervisor, Diane Nicholson.

NOTE: all information identifying your child will be removed from any reports to protect
confidentiality

_____ I consent for the data collected as part of this intervention/project to be presented at a
conference.

_____ I consent for the data collected as part of this intervention/project to be published in a
peer reviewed journal or professional publication.

Signed: ______________________________
Date: ______________________________
### Appendix B: Sample Raw Data – Baseline

<table>
<thead>
<tr>
<th>Day</th>
<th>Off-Task -Incidents</th>
<th></th>
<th>Non Compliant - Incidents</th>
<th></th>
<th>Overall Totals</th>
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<tr>
<td></td>
<td>AM</td>
<td>PM</td>
<td>Total</td>
<td>AM</td>
<td>PM</td>
</tr>
<tr>
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</table>
Appendix C: Unstructured Interview with Support Worker (11-09-07)

Which behaviours would be most significant to change?

Summary of answer: After discussing the participant with the support worker, it has been concluded that the target behaviours would be non-compliance, distractive behaviour, aggression and off-task behaviour. The participant has a history of severe problem behaviours. He has been suspended at least once a year since Grade one. The target behaviours for the current program will be off-task and non-compliant behaviour.

What strengths do the participant have?

The participant has excellent enthusiasm in subjects that he enjoys. He has good cognitive abilities and excellent verbal skills. According to his Psychological Assessment that was completed in 2003, he has verbal skills that fall within the superior range and performance skills falling within the high average. He has great listening comprehension. He tends to enjoy hands-on activities and participates well in peer activities.

What are some weaknesses?

The participant has difficulty with self-control and impulsiveness. He also has a problem controlling his emotions. This can be seen when a small incident sparks anger in the participant. He can be very oppositional and non-compliant at times. He also shows problems following rules and requests. He seems to need to develop self-esteem. He finds it hard to accept compliments on his work. He also has difficulty being cooperative. Academically, he has trouble with written expression and multi-step numerical problems. His pattern of inattention, processing speed and writing avoidance comply with his ADHD diagnosis.

What are some alternative strategies that have been utilized with Noah?

The participant is currently in a program that involves daily written communication with his mother, daily homework checks and calls home (if needed). He also has the use of the Student Support Center if he needs a place to calm down. The participant was on altered school days whereby he only attended the mornings in Grade seven.
Appendix D: Functional Assessment Observation Form

<table>
<thead>
<tr>
<th>Time</th>
<th>11:00</th>
<th>11:10</th>
<th>11:20</th>
<th>11:30</th>
<th>11:40</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Starting Date:** Sept 19 | **Ending Date:** Sept 29

**Name:** Noah Madassah

**Date:** Sept 19, 2007

**Events:**
- 1. 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.
- 20.
- 21.
- 22.
- 23.
- 24.
- 25.

**Behaviors:**
- Off-task
- Non-compliance
- Procedural
- Preoccupied
- Subject
- Random

**Perceived Functions:**
- Goal Obtained
- Escape/Avoid

**Redirected Attention:**
- Needed to focus on assigned task
- Not needed
- Lost interest

**Notes:**
- Observed behaviors are documented in parentheses with notation of how they were observed.
Appendix E: Sequence (ABC) Analysis of Baseline Data

<table>
<thead>
<tr>
<th>Present Antecedents of Problem Behaviour</th>
<th>Problem Behaviour</th>
<th>Present Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity:</strong></td>
<td><strong>Description:</strong></td>
<td>- Requires attention from people who prompt him to return to work</td>
</tr>
<tr>
<td>- seated school work</td>
<td>- Failure to stay on-task as indicated by: distracting students, playing with objects in desk, slouched in chair, head on desk</td>
<td>- Incomplete assignments</td>
</tr>
<tr>
<td><strong>Location of student:</strong></td>
<td><strong>Frequency:</strong></td>
<td>- Necessity to be in Student Support Center</td>
</tr>
<tr>
<td>- school: in classroom seated at desk</td>
<td>Ranges from 1.42 to 2.18 incidents per hour of instruction (as measured by baseline assessments to date)</td>
<td>- Reprimand</td>
</tr>
<tr>
<td><strong>Activity of others:</strong></td>
<td><strong>Duration:</strong></td>
<td>- Redirection</td>
</tr>
<tr>
<td>- other students are seated at desk, teacher giving lesson/ instruction</td>
<td>- the behaviour occurs until the student is prompted to return to task or given consequence of not complying with request or rule</td>
<td>- Attention from other students</td>
</tr>
<tr>
<td><strong>Subject being studied:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Language, French, Geography, Science, Math, History</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F: Interview with Noah (20-09-07)

Noah was asked questions from a Self-Evaluation Checklist. The following is a summary of information gathered from the checklist.

How do you feel about school?

There are times when Noah sees school as a positive experience. He states that he would like to be successful in school and become a game designer.

What are your strengths?

He states that he enjoys video games, science, gym and computers. He feels that he takes responsibility for his learning and is not afraid to ask for help. He states that it is easy for him to pay attention in class but hard to remain focused. He sometimes finds himself reading ahead in textbooks in class. He states that he is well organized. He has excellent computer skills and enjoys hands-on projects. He also enjoys sports (volleyball) and playing musical instruments (drums). A strength he feels that he has is great hand-eye coordination.

He finds it easy to find the right words to explain what he is trying to say.

In math, he states that he is able to understand math problems and remember steps to complete a problem.

What are some difficulties that you encounter?

Noah finds difficulty in French and Language. He states that he finds it hard to feel good about himself and his abilities. He does not like answering questions in class when he is not sure if the answer is correct. He states that he does not have the confidence to speak up in class. He realizes that he finds it very hard to listen to other people’s advice. He states that he is stubborn.

He finds it difficult to focus on homework at home because there are many distractions.

Noah states that it is hard for him to think about a situation and the consequences of his actions before reacting to it. This shows impulsiveness and a lack of self-control.

He finds it complicated to print and handwriting neatly and to copy/take notes. Writing complete sentences, organizing paragraphs, researching, spelling, grammar editing and punctuation are all issues for Noah. He has a lack of study skills as well.

He finds it a challenge to understand the meaning of what someone is trying to tell him.

He realizes that it is hard for him to get along with teachers and classmates.

What are some strategies you use to deal with your behaviour?

Noah states that he has no strategies but that he holds it in and unleashes it on other people. However, he has been seen to take time-outs, walk away and let a teacher know of the issue.

What are some goals you have?

Noah states that he wants to pass Grade eight with a B+ average. He wants to get along with others and adapt to being in class all day.
Appendix G: Incentive Survey with Participant

WHAT MOTIVATES YOU???

Read the following list of rewards. Number 5 of the rewards that you would like to receive for a job well done. Write the number 1 for the reward you would most like to receive and then number up to 5.

1. Be a helper to the custodian, librarian, another teacher or office staff (already a secretary)
2. Helping out with younger students
3. 15 minutes of "free time"
4. Recess in the gym (by self)
5. Have lunch with a friend or teacher
6. Read a story to the principal or teacher
7. Hand out Supplies
8. Free time in the Student Support Centre
9. Receive a positive note for home
10. Pick something from the prize box
11. Pick something from the treat box (e.g. juice box, crackers, granola bar etc.)
12. Free pencil, pen or eraser
13. Positive phone message home
14. Help with snack
15. Free Homework Pass
16. Stickers for good work/choices (on home form, schoolwork)
17. Have your work shown to the rest of the class

Other suggestions for rewards:

1. Free lunch recess with friend in gym (badminton)
2. -416-
## WEEKLY REWARD CHART

From ____________________ to ____________________

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Completed/ Timely Arrival</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Morning Recess (9:00 – 10:40)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Lunch (10:40 – 12:55)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of Afternoon Recess (12:55 – 2:50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before Hometime (2:50 – 3:30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Stickers Obtained for the Week ____
Total Stickers Available ____
Percent Stickers Obtained____
Appendix I: Reward System Criteria and Expectations

😊 Reward Chart 😊

* The number of rewards received will be based on the following percentages.
* Percentages will be calculated by dividing the total number of stickers obtained for the week by the number of stickers available for the same week.
* The number of stickers available will vary with the number of school days in the week.
  • One reward will be awarded for percentages between 60% - 75%
  • Two rewards will be awarded for percentages between 76% - 90%
  • Three rewards will be awarded for percentages between 91% - 99%
  • Four rewards for 100% !!!!!!

Reward Choices

* Recess in Gym (by self)
* Positive Note for Home
* Prize from the Prize Box
* Something from the Treat Box (e.g. juice box, granola bar)
* Stickers for good work/ choices on home form or chosen work (mark must be above 70%)

Expectations

In order to receive a sticker during the laid out time periods, the student MUST do ALL of the following during that period:
* Have all homework for the previous day completed
* Raise hand at all times in class in order to speak or ask a question
* Engage only in positive interactions with other students
* Complete work assigned in class to the standards expected by the teacher (e.g. complete sentences)
* Respond positively to the requests made by the teacher
* Focus on classroom instruction
* Respect and follow ALL classroom rules
* Respect the right of other students to a positive learning environment
* Respond in a positive manner to the actions of other students