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Influencing the on-task and off-task behaviours of children who have attention problems or attention deficit hyperactivity disorder through the use of a token economy and self-management

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Influencing the on-task and off-task behaviours of children who have attention problems or attention deficit hyperactivity disorder through the use of a token economy and self-management.

by

Renee Ball
(Bachelor of Arts in Education).

Date of submission: November 14, 1997.
Abstract

Attention problems have been identified as a major contributor to below average academic competence in Western Australian students. The present study used an A B C D A' single-subject experimental design to investigate the effects of a token economy, managed first by the researcher, and then by participants, on off-task behaviour. Phase A was a baseline, phase B was a token economy managed by the researcher, phase C was a token economy managed by the participant, phase D was the thinning of the reinforcers (still managed by the participant), and phase A' was a return to baseline. Two participants were involved. One was a Year 5 boy who had previously been diagnosed with attention deficit hyperactivity disorder (ADHD), and had been prescribed medication, but was not receiving medication at the time of the study. The second participant was a Year 4 boy who was not diagnosed with ADHD, but suffered attention problems. Results show that the token economy was effective in increasing the on-task behaviour of both participants, and that self-management of the token economy further increased on-task behaviour. Maintenance of behaviour was achieved with one of the participants. The study shows that students with attention problems are capable of managing their own behaviour and can therefore increase their independence. Teachers can take the strategies used in this study and individualise them to suit the needs of their own students.
Declaration

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

Signed: [Signature]
Acknowledgements

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Chapter 1
Introduction

**Background**

Behind each classroom door exists a world of diversity. In all classes, students of differing backgrounds, abilities and personalities are to be found. These students each have individual, educational needs which must be met in order for them to develop appropriately. Some students have special learning needs, and require instructional adaptations in order to learn effectively. They experience difficulty learning in the regular class environment because of their special learning needs.

One group of special students are those who suffer from behavioural disorders. These are students who are characterised by inappropriate school behaviour (Lewis & Doorlag, 1995). One group of students who suffer from behavioural problems are those who display attention problems, or who are diagnosed as having attention deficit hyperactivity disorder (ADHD). This is a neurobiological disorder that causes developmentally inappropriate levels of inattention, hyperactivity, or impulsivity (Mathes & Bender, 1997). Children who have attention problems or suffer from the disorder experience great difficulty staying on-task during class. They are unable to sit still in their seats, constantly manipulate objects, and have poor social relationships with their peers and others. They are easily distracted, and often fail to complete set tasks. These characteristics affect their learning to a great
extent and compromise their academic competence, as these students fail to acquire knowledge and skills necessary for development (Lewis & Doorlag, 1995).

Children with attention problems or ADHD are normally mainstreamed. This means that they receive their education in a regular classroom with their average-achieving peers, and a regular class teacher. Regular classroom teachers are expected to provide educational modifications for students with attention problems, as well as to cater for the needs of the other students. Teachers often feel overwhelmed and frustrated by the variety and seriousness of the difficulties attention problems cause (Mathes & Bender, 1997). Educators are in need of effective strategies for managing behaviour and improving academic performance for students with ADHD and attention problems. This is an issue for all teachers, including those in Western Australia. A report on the Western Australian Child Health Survey was released in February 1997. The report documented the results of a survey which investigated the effects of mental and physical health on academic competence. The survey found that approximately 5% of 4- to 11-year-olds in Western Australian schools suffered from attentional problems, and that such problems were a major factor contributing to below average competence (Zubrick et al., 1997). This highlights the need to explore and develop strategies that teachers can implement in order to cater for the needs of these students.

Students with behaviour problems, such as ADHD usually require some assistance in academic instruction, as they learn at a much slower rate than their
average-achieving peers. However, their most urgent needs are generally control of disruptive and off-task behaviours (Lewis & Doorlag, 1995). Off-task behaviours are those such as calling-out, wandering around the room, "day dreaming", talking to other class mates, and playing with objects on the desk. Off-task behaviours are a major barrier to effective teaching and learning, and must be controlled where possible so that the academic achievement of the students with attention problems, and the other class members is not compromised.

Students with behavioural problems are capable of learning to act appropriately. Their classroom behaviour and work habits can be improved with appropriate behaviour management techniques (Lewis & Doorlag, 1995). It has been noted that children with attention problems appear to respond positively to strategies that involve frequent feedback and salient consequences (DuPaul, Gardill & Kyle, 1996; American Psychiatric Association, 1994). Behaviour management strategies incorporate this concept. Two such strategies will be utilised in the present study in order to determine their effectiveness in increasing the on-task behaviour of children with attention problems. The first strategy is that of the token economy. This is a behaviour change system in which students earn tokens for each occurrence of a desired behaviour. These tokens are then exchanged for rewards or reinforcers at a later time (Lewis & Doorlag, 1995). The second strategy is self-management. This refers to any process one undertakes in order to modify one's own behaviour. It includes self-monitoring and self-rewarding.
Significance of the study

The present study is significant for three main reasons.

The first is that the study will add to the current knowledge base about attention problems and how they can be overcome. Much research has been conducted which investigates the three areas of attention problems, token economies, and self-management separately. There is much literature that discusses attention problems and ADHD. Characteristics, problems encountered, and effects of medication have been well documented. Token economies have been used in classrooms since the 1960s, and effective results have been proven in many different settings (Naughton & McLauglin, 1995). The benefits and problems of self-management also have been widely studied and written about. However, there seems to have been little investigation into what happens when attention problems, token economies, and self-management are brought together. The present study therefore aims to do just that. This will be done by examining the effects on behaviour of using a token economy and self-management with children who experience attention problems.

Secondly, this study will contribute to the knowledge base of Western Australian educators. Much of the research on attention problems and behaviour management has been conducted outside of Australia. The present study is
conducted within Western Australian regular class settings, and will therefore provide practical information about how the strategies influenced behaviour in real situations. This is of particular importance in this state for two main reasons. Firstly, there is a high rate of diagnosis and prescription of stimulant drugs for ADHD in Western Australia. This state actually has the highest rate of prescription of drugs for the disorder in the nation (Zubrick, et al., 1995). Secondly, many children with special needs in Australia have to remain in regular classrooms without any assistance being provided for the teacher, as special education does not receive as much government funding as other areas of education. Australian teachers therefore need to seek non-time-consuming, effective strategies that can be used with children who have attention problems.

Finally, the study will prove beneficial to society, particularly to those who suffer attention problems and their families. It will determine the feasibility of behaviour management as an alternative to medication for children suffering attention deficit hyperactivity disorder. The medication does not actually "cure" the symptoms of the disorder. For some parents, medication to improve attention problems or hyperactivity in their child is seen as a "last resort" for various reasons which will be discussed later, and behaviour management may be a possible solution they wish to explore.
Purpose/aim of the study

The purpose of the present study is to investigate three major questions.

Firstly, the study aims to determine whether or not a token economy system is effective in increasing the rate of on-task behaviours of children with attention problems. Children in the study are observed in their regular class setting, and a token economy is then established. Off-task and on-task behaviours are recorded in order to evaluate the effects of the token economy system on the child's behaviour.

Secondly, the study aims to determine whether or not children with attention problems are capable of managing their own behaviour. Participants are taught how to manage the token economy themselves. They are observed by the experimenter, and their ability to manage the token economy is assessed by the accuracy of their self-recording.

Finally, the study aims to assess the effectiveness of combining a token economy system and self-management. Participants are observed and behaviours recorded in order to ascertain whether or not rate of on-task behaviour increases or decreases once the participant becomes responsible for managing his or her own behaviour.
Definitions

The following key terms are discussed in detail in the literature review, however brief definitions are also given below.

Attention deficit hyperactivity disorder: This is a neurobiological disorder which causes developmentally inappropriate levels of inattention and hyperactivity. It is characterised by a "persistent pattern of inattention and/or hyperactivity/impulsivity", and is much more frequent in males than in females (American Psychiatric Association, 1994).

Token economy: The token economy system is a behaviour management strategy which is used to produce positive behaviour change. Under a token economy system, students are awarded a token each time they perform a specified desired behaviour. These tokens are then exchanged at a later time for rewards or reinforcers (Wolery, Bailey & Sugai, 1988).

Self-management: This refers to "any process an individual uses to influence his or her own behaviour" (Carter, 1993, p. 5). It includes processes such as monitoring and rewarding one's own behaviour.
Overview of the thesis

Following this introductory chapter, a review of relevant literature is given. Research articles in which previous studies involving attention problems and behaviour management strategies are reviewed. Surveys which provide information about attention problems and their prevalence are discussed. Other literature is also discussed in relation to attention problems and behaviour management strategies. The theoretical framework underlying behaviour management is also outlined. The research questions for the present study are given at the end of this review of relevant literature. This chapter is followed by a description of the children who participated in the study, and the procedures followed when carrying out the study. Research design, materials and ethical considerations are also discussed. A chapter describing the results of the study follows. In this chapter graphs showing the on-task and off-task behaviour of the participants are described and interpreted. A discussion chapter concludes the thesis, in which conclusions drawn, limitations of the study, and implications for further research and classroom practice are examined.
Chapter two consists of a review of relevant literature. The symptoms, prevalence, and implications of attentional problems are described. Included is a discussion of attention deficit hyperactivity disorder, and a theoretical framework. Two behaviour management strategies -- token economy systems and self-management -- are then discussed. The chapter concludes with a statement of research questions for the study.

Attention problems

In 1997, a report of the Western Australian Child Health Survey was released. This was a report that examined the associations between the physical and mental health and the academic performance of 4- to 16-year-old children in the state. Data were gathered from 397 schools around Western Australia. Most of the schools were Government schools, although some Catholic and Independent schools also participated. The report was a documentation of community characteristics, school environments, and health and mental factors that influence the academic competence and achievement of Western Australian students. The survey found that attention
problems were one of the major factors affecting learning and contributing to below average academic competence in students.

Attention problems can arise for various reasons. These include intellectual disability, hearing impairment and epilepsy. Environmental factors may be influencing a student's ability to maintain attention, for example, colourful stimuli around the room, proximity of other class members, difficulty level of task and other such factors.

The reported number of children experiencing attentional problems has increased over the last decade. In 1997, approximately 5% of 4- to 11-year-olds in Western Australia have significant attention problems (Zubrick et al., 1997). Educators have seen an increase in the number of these children who are diagnosed with and treated for attention deficit hyperactivity disorder (ADHD). The Western Australian Child Health Survey reported that one in five children with attentional problems would be expected to be diagnosed as having ADHD. This is a neurobiological disorder which causes developmentally inappropriate levels of inattention and hyperactivity, and is much more frequent in males than in females (American Psychiatric Association, 1994). As stated in the Diagnostic and Statistical Manual of Mental Disorders (1994), there are five criteria which must be met in order for a diagnosis of attention deficit hyperactivity disorder to be made. These are outlined below:
Criterion A. There must be a "persistent pattern of inattention and/or hyperactivity/impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development".

Criterion B. "Some hyperactive or impulsive symptoms that cause impairment must have been observed before the age of 7 years".

Criterion C. "Some impairment from the symptoms must be present in at least two settings".

Criterion D. "There must be clear evidence of interference with developmentally appropriate social, academic or occupational functioning".

Criterion E. The symptoms cannot be better accounted for by another disease or disorder.


Criterion A refers to a pattern of inattention and/or hyperactivity/impulsivity. These characteristics are manifested in behaviours typically observed in children with the disorder. Consideration of such behaviours is an important part of the diagnostic process. Inattention may manifest itself in social or academic situations. Behaviours that indicate a pattern of inattention include messy, careless and disorganised work habits, difficulty in sustaining attention and completing tasks, and failure to attend to or follow instructions. Children with the disorder are easily distracted by stimuli that are ignored by others, and in social situations may constantly change the subject or fail to listen to others. For example, a child
experiencing attention problems may rush through an activity worksheet, and hand it in without completing it or paying any attention to details. The child may then move onto another task, and fail to persist with it once again. Other characteristics stated in Criterion A are those of hyperactivity and impulsivity. These characteristics are also manifested in certain behaviours which are commonly observed in children with attention deficit hyperactivity disorder. Hyperactivity can be seen when children squirm or fidget in their seat, or do not remain seated as appropriate. They may run or climb excessively, and often have difficulty engaging quietly in activities, making noise at an inappropriate level. Hyperactive children are described as being constantly "on-the-go" and frequently "fidget with objects, tap their hands, and shake their legs and feet excessively" (American Psychiatric Association, 1994, p.79). A hyperactive child is one who displays difficulty in remaining still and quiet for any length of time. The level of hyperactivity displayed by a child may be affected by the environmental surroundings or the setting in which the child is behaving.

Impulsivity is the third possible characteristic of children with attention deficit hyperactivity disorder. It manifests itself through impatience. Answers are blurted out without thought, and other classmates are frequently interrupted. Individuals have difficulty waiting for their turn, listening to directions, and staying away from things they are not allowed to touch. This can occur to the point where functioning in academic, social or occupational settings is affected. Impulsivity can also lead to accidents, as the child acts before thinking and without considering
consequences. For example, a child may ride a bicycle across a road without looking, or grab a sharp object.

Although most children with the disorder exhibit symptoms of both inattention and hyperactivity-impulsivity, there are some in whom one of these patterns is dominant (American Psychiatric Association, 1994). Some children may display many inattentive behaviours constantly, and occasionally in some settings may be hyperactive and impulsive. Other children may be predominantly hyperactive and impulsive, and display inattention less frequently. Due to this fact, there are three subtypes of attention deficit hyperactivity disorder. This enables the child to be diagnosed accurately. The three subtypes are outlined below.

- **Attention deficit hyperactivity disorder, combined type.** This subtype should be used if both inattentive and hyperactive/impulsive behaviours are evident.
- **Attention deficit hyperactivity disorder, predominantly inattentive type.** This subtype should be used if the child exhibits mostly inattentive behaviours.
- **Attention deficit hyperactivity disorder, predominantly hyperactive/impulsive type.** This subtype should be used if the child is mostly hyperactive/impulsive.

(American Psychiatric Association, 1994).

Inattention and hyperactivity, as described above, inhibit the child's ability to remain on task during class. As stated by Lewis and Doorlag (1995), this issue is of major concern to educators because off-task behaviours compromise students' academic achievement, and may cause other children to reject them socially. In
order to achieve in the school system, students must be able to sustain attention so that directions, new information, and important concepts can be understood. Attention problems prevent children from being able to do this, and therefore their academic competence is at risk.

In order to help children who have been diagnosed with ADHD to concentrate more effectively, medication is often prescribed. Stimulant drugs such as methylphenidate (Ritalin) and dextroamphetamine are administered to children daily. Such medication produces favourable results in 70% of children who receive it (Mathes & Bender, 1997). A favourable result is seen when attention problems decrease and the child is able to function more effectively in the classroom, spend more time on task and socialise in a more acceptable manner. This leaves 30% of children who do not respond favourably, and whose inattentive behaviours must be managed in other ways.

Many ethical issues and practical problems surround the prescription of medication for attention problems. One such issue is that there are side effects of taking medication. Decreased appetite and disrupted sleep patterns are the two most frequently reported side effects in children (Whalen & Henker, 1980). Other side effects include stomach-ache, headache, and social withdrawal. Repression of personality can also occur, with the child becoming withdrawn (Robinson, Newby & Ganzell, 1981). Another ethical issue involved in the prescription of medication is that of the parents’ values and beliefs. Some parents are strongly opposed to
medication because they view it as "drugging" the child. They believe it encourages
dependence on drugs, and that the benefits do not justify the risks (Savage, 1996).
Thirdly, there is little evidence to suggest that medication leads to long term
improvement in functioning (DuPaul & Eckert, 1997). Although medication may
help to improve behaviour and facilitate learning by making the student more
"teachable", it does not remediate academic problems or teach the student strategies
for managing his or her behaviour (Lewis & Doorlag, 1995). Mathes and Bender
(1997), and Gardill, DuPaul and Kyle (1996) state that those on medication often
require other types of interventions, for example, behaviour management, as well as
medication in order to produce positive behaviour change.

These controversial issues are of particular relevance in Western Australia.
An earlier survey, conducted in 1995 (Zubrick et al.), reported that Western
Australia had the highest rates of drug prescription for ADHD in the nation.

Clearly, alternative interventions need to be explored so that the problems
outlined above can be avoided. Such interventions must be effective in helping
children to overcome their attention problems so as to increase their time on-task and
therefore improve their academic achievement. In the past, various methods and
strategies have been used to deal with inattentive and hyperactive behaviours. Some
researchers have suggested that the solution to these problem behaviours lies in the
child's diet. Studies conducted by Feingold in the 1970's investigated the
relationship between level of hyperactivity and the child's intake of artificial food
colourings and natural salicylates. He claimed that when he put children on a diet which did not include food colourings or salicylates, 30% of them showed a "dramatic" decrease in hyperactivity, and 18% showed a "favourable" decrease. However, Feingold's claims were examined by the Western Australian National Advisory on Hyperkinesis. It was found that the claim that hyperactive children improve significantly when placed on such a diet could not be confirmed. Many studies involving dietary treatment for ADHD have been criticised due to their lack of experimental control (O'Leary, 1980).

Other techniques that have previously been employed to improve attention deficit hyperactivity disorder behaviours include modification of the environment and teaching materials. These methods involve structuring the environment so as to prevent or discourage the behaviours occurring. Distracting stimuli around the classroom are removed, the child is seated away from others and close to the teacher and teaching materials are simplified so that only the most relevant information is presented. In this way, the teacher aims to focus the child's attention as much as possible on the task at hand. However, critics of this concept of "reducing the environmental stimuli", argue that by structuring the environment in such a way, hyperactivity levels could be increased due to under-stimulation.

Another technique that has been applied in the past in order to overcome attention problems is that of behaviour management. The principles of behaviour management will now be discussed.
Theoretical framework - Behaviour theory

Behaviour theory has influenced the teaching practice of educators for many years. Behaviour management strategies which produce positive behaviour change have been developed and used in classrooms of all types. These strategies emphasise overt behaviours and the environmental factors that are related to those behaviours. As stated by Zirpoli and Melloy (1997), the following assumptions underlie the philosophical foundations of behaviour theory and practice:

- Most behaviours are learned,
- Most behaviours are stimulus-specific,
- Most behaviours can be taught, changed or modified,
- Behaviour change goals should be specific and clearly defined, and
- Behaviour change programs should be individualised.

(Zirpoli & Melloy, 1997, p.5).

The first assumption above says that most behaviours are learned. This refers to the observation that individuals tend to display behaviours that have previously been reinforced, and avoid behaviours that have not been previously been reinforced. A behaviour is an overt response. For example, crying, talking and hitting are overt responses. Behaviourists are concerned with overt behaviours as they are observable. Skinner argued that appropriate and inappropriate behaviours are learned in the same way. Therefore, behaviour management strategies aim to provide
learning experiences for students that encourage the learning of appropriate behaviours.

The second assumption of behaviourism is that most behaviours are stimulus-specific. This refers to the notion that children behave differently in different environments. This can be explained by the fact that each environment in which the child behaves has a different set of stimuli. Stimuli are "events or activities within the environment that are capable of forming a relationship with the behaviour" (Zirpoli & Melloy, 1997, p.10). For example, there are different people, expectations and activities in the classroom and home situations which may influence behaviour. These stimuli are classified into two categories - antecedents and consequences. Antecedents are defined as stimulus conditions that occur just prior to the behaviour. They may take the form of teacher instructions, seating positions, or resource materials. Consequences are events or changes that occur in the environment after a behaviour has been performed. They include reinforcement and punishment. Manipulation and modification of antecedents and consequences by teachers form the basis of many behaviour management strategies. Figure 1 shows how antecedents and consequences are related to behaviour:

![Figure 1 - Relationship between antecedents, behaviour, and consequences.](image-url)
The diagram shows that antecedents affect behaviours, and behaviours in turn result in consequences. These consequences may be positive or negative, and also influence the behaviour.

The remaining assumptions emphasise the importance of individualising behaviour change programs. Because different children behave differently under different stimulus conditions, behaviour management must be tailored to suit the child and his or her environment in order to be effective. Clear and specific goals describing the behaviours to be modified and the stimulus conditions must be documented. This ensures that all involved with the child are aware of the program and can apply it consistently across all settings.

The present study employs a strategy which focuses on manipulation of consequences. Figure 2 illustrates the stimuli and behaviours involved.

Figure 2 – Theoretical framework showing stimuli and behaviours involved in the present study.
Figure 2 shows that the teacher's instructions are the antecedent stimulus, and reinforcement is the consequent stimulus. After the teacher has issued instructions, two behaviours can occur: on-task behaviour or off-task behaviour. If on-task behaviour occurs, the child receives reinforcement. If off-task behaviour occurs, the child does not receive reinforcement. Reinforcement is "any stimulus that maintains or increases the behaviour exhibited immediately prior to the presentation of the stimulus" (Zirpoli & Melloy, 1997, p. 148). In this case, the reinforcement is applied in order to increase the student's on-task behaviour.

In his book The Technology of Teaching (1968), Skinner discusses the importance of reinforcement as opposed to punishment. He states that when aiming to generate appropriate behaviour, it is not good practice to merely suppress inappropriate behaviour: "We do not strengthen good pronunciation by punishing bad ...[or]... make a student industrious by punishing idleness, or interested in his work by punishing indifference" (p. 149). A Washington study by McLaughlin and Malaby (1972) illustrates the importance of this concept. Students in a regular class were subjected to two different experimental conditions in an ABAB design. During A conditions, students lost points for inappropriate behaviour. During B conditions, students earned points for appropriate behaviour. Results showed that inappropriate behaviours were at the lowest level during B conditions, when reinforcement as opposed to punishment was in effect. This emphasis on reinforcement of appropriate
behaviours is seen in many behaviour management programs and utilised in behaviour management strategies such as the token economy.

**Token economy systems**

The token economy is a behaviour management strategy that educators have used in the classroom for many years. It is a method of behaviour modification which relies upon the manipulation of consequences. Token economies utilise the principles of immediate and delayed gratification in the form of a contingency management system (Anderson & Katsiyannis, 1997). Under such a system, students are awarded tokens each time they perform a specified desired/target behaviour, thus receiving immediate gratification for the desired behaviour. These tokens can be things such as stars, points, raffle tickets, or ticks on a chart. Token economies are modelled on monetary systems; once students have earned the specified number of tokens, they can exchange them at a later time for reinforcers, in the same way that money is exchanged for goods and services (delayed gratification). Reinforcers can include free time, rubbers, pencils, favourite activities, etc. It is these reinforcers which give value to the otherwise "worthless" tokens. When implementing a token economy, the following considerations are important.

Firstly, target behaviours must be carefully selected and defined. Students must fully understand which behaviours will earn them tokens and which are
unacceptable. Behaviours such as calling out, being out-of-seat, being off-task, hyperactivity and attendance have in the past been successfully managed by token economy systems (Naughton & McLaughlin, 1995).

A second consideration is that tokens to be used should be carefully selected so as to maximise the effectiveness of the token economy. Effective tokens are those which are easily delivered to the students by the teacher. This will prevent time wastage and the drawing away of attention from the task at hand. Tokens should also be durable, and unable to be easily obtained or duplicated. For example, a paper clip token could enable students to manipulate the token economy, as they are easily obtained from other sources. Also, tokens should be resistant to satiation. This prevents students from becoming bored with, or "flooded" with the token, and its reinforcing value will therefore remain appropriate (Wolery, Bailey & Sugai, 1988).

Another consideration for teachers to make when establishing a token economy concerns the reinforcers. These must be appropriate in order for the economy to be effective. Teachers can find out what is reinforcing for the students by asking them, observing them during free time, or allowing students to choose from a menu of reinforcers. This individualises the system, and ensures that students will be willing to behave appropriately and work for the reinforcers.
Rules for management of the program must be clear to all involved. Teacher and students should be aware of how and why tokens are earned, and when they can be exchanged for reinforcers.

A final, but extremely important consideration which must be made is the fading of the token economy. The aim of this behaviour management strategy is to encourage students to perform the desired behaviour without any prompts or rewards. Strategies to gradually "wean" the students off the system are an essential feature of the token economy. One such strategy involves changing the schedule of reinforcement. As students begin to respond positively to the token economy, and appropriate behaviours are steadily increasing, the teacher can change the way in which she or he delivers tokens, or the way in which tokens are exchanged for reinforcers. Instead of being reinforced after every 5 tokens, students must earn 10, and then 20 tokens and so on, in order to obtain reinforcement. In this way, the reinforcers are gradually faded, and natural reinforcement such as teacher praise takes their place (Wolery, Bailey & Sugai, 1988).

A study conducted by Shook, LaBrie and Vallies in 1990 illustrates the use of a token economy. Three students from a regular first grade classroom in a low socio-economic area of Washington participated in the study. They were identified by the teacher as behaving inappropriately and disturbing others. Target behaviours in the study were being out-of-seat, calling out, constant manipulation of objects, and failing to attend to the teacher or activity for more than 5 seconds. After baseline
data were gathered, the children underwent brief training. This consisted of the teacher taking the students aside and describing the disruptive behaviours, and explaining that they could earn points for not performing these behaviours. Students were then told that they could exchange the points at the end of the day for rewards such as free time, small toys, "good work notes" etc. At the commencement of the each half hour session, a timer was set for 5 minutes. At the end of this time any points earned were recorded by the teacher on the students' point cards. This continued for the half hour, while an observer recorded any disruptive behaviours that occurred. Follow-up data were then recorded twice a week for three weeks.

results of the study demonstrated that token economies can be very effective in decreasing off-task behaviour. The mean number of disruptive behaviours per session for the three students dropped from 13, 11 and 22 during baseline to 0.7, 1.9 and 0.0 respectively during intervention. It can be seen that the use of the token economy resulted in a dramatic decrease in the inappropriate behaviours of all three subjects. The follow-up data showed that this low level of disruptive behaviour was maintained after the token economy had been withdrawn. During the token economy phase, one of the three subjects began silently and frequently to cue the others to stay on task. Although not part of the training, the student naturally implemented this peer-management strategy of her own accord, in order to help others earn more tokens.
Other studies have achieved similar positive results. For example, a Utah study involving a class of 18 third grade hyperactive boys found a token economy system to be effective after many other strategies that had been tried with the class had failed (Robinson, Newby & Ganzell, 1981). Problem behaviours included pencil throwing, wandering around the room, and hitting. These behaviours were preventing students from completing their tasks. An ABAB design was implemented, in which B phases were the token economy phases, and the A phase was a baseline condition. B phases were conducted for 14 and 13 school days respectively, and the A phase was conducted for 5 school days in-between the B phases. A token economy was established during reading time, and tokens were awarded for completion of reading assignments. The results showed that the token economy increased dramatically the number of assignments completed. During the token system conditions, the class completed an average of 34.81 and 39.57 assignments daily. When the token system was withdrawn, the average number of assignments completed decreased to 3.80 per day for the whole class. The study demonstrated that token economics can be used to improve academic performance with hyperactive children, but these improvements were not maintained when the token system was withdrawn, unlike the study conducted by Shook et al. (1990).

Another study by Ayllon, Layman and Kandel (1975) compared the effectiveness of stimulant drugs (methyphenidate and ritalin) and reinforcement in three chronically hyperactive children (aged 8-10 years). Hyperactivity and
academic performance were recorded across four different experimental conditions: (a) on medication, (b) off medication, (c) no medication and reinforcement of maths, (d) no medication and reinforcement of maths and reading. Results showed that hyperactivity was controlled as effectively by the reinforcement as it was by the medication in all participants. Average percent of hyperactivity for the three children was 24% during the medication phase, and 20% during the no medication with reinforcement phase. Academic achievement was dramatically higher when the children were not on medication and receiving reinforcement. The average percent correct in reading and maths increased from 12% during the medication phase to 85% when medication was discontinued and reinforcement was introduced. Much research has been done which demonstrates the positive effects reinforcement and token economies can have on the behaviour of children with attention and hyperactivity problems.

Despite reports of such positive results, there are critics of the token economy. They argue that the strategy should not be employed to change behaviour for several reasons. The first of these is that they believe reinforcement is bribery. Critics argue that reinforcers do not bring about real change in behaviour, but "bribe" the person to perform a desired behaviour. However, the definitions of bribery and reinforcement are different. Bribery refers to the "illicit use of rewards, gifts, money or favours to pervert judgement or corrupt the conduct of someone" (Kazdin, 1980, p. 54). Reinforcement is delivered for behaviours that are seen to be beneficial to
the individual or others. Although bribery and reinforcement both involve giving rewards for a certain behaviour, their purposes and intents are different.

Another concern related to this issue is that children who receive reinforcement will perform the desired behaviour only if they are to be rewarded for doing so. This is referred to as "manipulation" (Kazdin, 1980). For example a child who is being asked to clean up his/her room may say "I will not do it unless you give me a reward". However, Kazdin states that individuals who receive reinforcers for behaviour rarely demand reinforcers for the behaviour in other situations.

A third reason in the argument against reinforcement is that individuals may become dependent on extrinsic reinforcers. Some believe that individuals should work for the intrinsic value of an activity, rather than rely on rewards. However, this belief does not take into account the reality of every day adult life. Few adults would continue to work if they were not paid to do so. Extrinsic reinforcers are present in all aspects of life, and although learning does have an intrinsic value of its own, extrinsic reinforcers enhance that value. Dependency on extrinsic reinforcers can be avoided by gradually thinning the extrinsic reinforcers and replacing them with natural reinforcers such as free time and teacher praise. This is done through changing the schedule of reinforcement - a "rule for denoting how many responses and which specific responses will be reinforced" (Wolery, Bailey & Sugai, 1988. p. 300). A reinforcement schedule can be continuous, in which case every correct response or behaviour is reinforced; or intermittent, where only some correct
responses or behaviours are reinforced. By moving from continuous to intermittent schedules, the behaviour continues to occur as the rewards are gradually withdrawn.

A fourth concern regarding behaviour modification techniques is that they are coercive. This concern has arisen from the misuse of aversive methods with individuals. Punishment procedures such as "timeout" are seen by some to be inappropriate for use in classroom as they are aversive and a negative experience for the child. Some critics argue that influencing or controlling behaviour in others at all should be avoided. Although behaviour modification by design attempts to influence behaviours, it does not necessarily involve aversive procedures to do so. The behaviour management strategies used in this study do not use any aversive procedures; rather, they focus on positive reinforcement. When establishing a behaviour modification program, the child and parents must be consulted and consent gained for the program to begin. In this way, the rights of the child are protected and the best possible method for improving behaviour can be found.

The token economy is one strategy that relies heavily upon the use of reinforcement. Fading strategies are vitally important so that the student does not become dependent on the rewards. Peer-mediated and self-management strategies provide an avenue for allowing students to become less dependent on the rules and rewards of the token economy and more accountable to themselves (Wolery, Bailey & Sugai, 1988). Self-management strategies will now be discussed.
**Self-management**

The ultimate goal of education is to empower students to function effectively without teacher-mediated interventions or control. Achieving such a level of independence can prove difficult for students with attention problems, as they often need some sort of guidance to remain on-task and therefore learn necessary skills. One way in which educators can help students to develop independence is to teach them self-management skills. Self-management refers to "any process an individual uses to influence his or her own behaviour" (Carter, 1993, p. 5).

Many people engage in self-management without being aware that they are doing so. For example, students on a tight budget may record what they spend each day in an effort to monitor spending. This is an illustration of one of the components of self-management, namely, self-recording, or self-monitoring. This requires the student to record the frequency of a given behaviour. Self-monitoring can be effective in shaping behaviour. It has been found that simply becoming aware of a behaviour, for example, paying attention, has increased the frequency of that behaviour, without further need for intervention (Gardill, DuPaul & Kyle, 1996).

A study by Workman, Helton and Watson (1982) involved a 4-year-old boy who was consistently off-task and did not comply with adult instructions. The child was given a recording sheet and taught to mark the sheet if he was on task when a signal from a kitchen timer sounded every 5 minutes, whilst he was working on teacher-assigned drawing or cutting activities. This self-monitoring procedure
increased the boy's on-task behaviour from 37.73% during baseline to 63.66% during the self-monitoring phase. This study shows that the simple act of self-monitoring produced positive behaviour change and increased the child's time on task. Self-monitoring enables behaviour management across settings, as it is not restricted to one teacher carrying it out in one room.

Another component of self-management is that of self-rewarding, or self-reinforcement. This occurs when an individual rewards himself or herself contingent upon the performance of a certain behaviour. For example, students working on an assignment may say to themselves "once I have finished this section, I can go and have a piece of chocolate cake". The students have shaped their own behaviour by offering themselves reinforcement if the desired behaviour is performed. Studies have shown that the self-reinforcement is more effective if the goal is made known to others, rather than kept private (Wolery, Bailey & Sugai, 1988).

Osborne, Kosiewicz, Crumley and Lee (1987) conducted a study in Virginia involving distractible students using self-management. Five students aged between 10 and 16 who were described by their teachers as impulsive, having short attention spans, and difficulty concentrating during independent seatwork participated in the study. Their teachers also said that the students were capable of completing the given work if under constant supervision. Two of the students were emotionally disturbed, and the other three were intellectually disabled. All were in regular
classrooms. The study involved teaching the students to monitor their own behaviour by recording themselves as either on- or off-task whenever a tone was emitted from a tape recorder. They were given a self-recording sheet and were taught to ask themselves "Was I paying attention to my work?" when the tone sounded. They then marked the appropriate box on the sheet. Students were taught which behaviours were examples of "paying attention to my work" and which behaviours were not.

The results of the study show that the self-monitoring technique was highly effective. The on-task behaviours of all children increased significantly. The emotionally disturbed children increased their time on-task from 5% during baseline to 30% during the self-monitoring phase. The intellectually disabled children increased their time on-task from 23% to 86%. When questioned about the strategy, the teachers involved stated that disruptive behaviours also decreased during self-monitoring, and that the children benefited by becoming more responsible for their own behaviour. Teachers also stated that they were able to work with other children with less interruptions. In addition, the teachers stated that the tape recorder did not interfere with or disrupt the other class members.

Mathes and Bender (1997) conducted a similar study with three boys with ADHD. The boys were receiving medication, but still displayed high rates of disruptive behaviour, failure to complete tasks, and daydreaming. After collecting baseline data, the boys were taught to self-monitor in the same way as in the study
by Osborne, et al. The students used a sheet to record their behaviour as a tone from a tape recorder sounded. The intervention was conducted in the boys' resource room. The results showed dramatic increases in on-task behaviour during intervention phases. Time on-task climbed from 40%, 38%, and 37% to 97%, 87% and 94% respectively for the three students.

A study by Glynn, Thomas and Shee (1973) sheds light on the effects of who manages the token economy on its success. The researchers showed that high levels of on-task behaviour established by externally administered reinforcement were maintained when self-management was introduced. The study was conducted in a regular Grade two classroom in New Zealand. The teacher of the class had established a token economy program in the class prior to the commencement of the study. Although effective, she found that during reading, when she worked with small groups of children at a time, the other children were disruptive. The token program was inappropriate in this situation as it was difficult to observe the behaviour and award tokens when teaching the small group. Glynn, Thomas and Shee then introduced self-management of the token economy system during reading lessons. Students were taught to mark a grid if they were on-task whenever a beep from a tape recorder sounded. Students rewarded themselves with one minute of free time before recess for each mark recorded (a maximum of ten minutes could be earned in one day).
The self-management technique produced positive results. The level of on-task behaviour increased, and the variability of behaviours decreased. The mean percent of on-task daily behaviour for all subjects increased from 58% during baseline to 90% during self-management. When the researchers were managing the token economy, time on-task ranged between 72% and 88%. When the students became responsible for managing the token economy, time on-task was 90% or higher. The study showed that Grade two children were able to use self-management procedures to increase and stabilise levels of on-task behaviour.

Students who are able to master self-management skills benefit from doing so in many ways. They become more able to move independently and appropriately through social settings. This is an important goal of special education. Self-management is a strategy that also has practical benefits. Relying on teachers or others to modify behaviour can result in inconsistent contingency management. Students work in many different settings during their day. They have different teachers, and participate in different activities. Contingency systems which rely on reinforcement for appropriate behaviour may be difficult to apply consistently unless all teachers and parents who work with the child are informed of the systems and the rules and behaviours involved (Carter, 1993). Self-management overcomes this problem, as the student is the only one who needs to know how the system works for it to be effectively carried out, once he or she has mastered it.
Self-management also provides students with opportunities to "bridge the gap" between a behaviour and its delayed consequences. If students monitor their own behaviour, they are more able to understand the particular behaviour that they are being reinforced for as they record the occurrence of the behaviour as soon as it occurs, and the consequences of that behaviour are known at that moment. Special students may experience difficulty in understanding why they are being reinforced/punished some time after the behaviour itself occurred (Carter, 1993).

Self-management skills encourage independence, and allow students to become accountable for their own behaviour. However, they must be implemented with care to be effective. Training the students, particularly students with special needs, is vitally important. This must be done in a systematic and consistent manner, and can be time consuming, depending upon the needs of the student. Clear explanation and definition of behaviours involved is required. Some critics argue that maintenance and generalisation of treatment effects do not occur. However, there does not seem to be a great deal of research which investigates the maintenance and generalisation of self-management procedures. Ninness, Fuerst, Rutherford and Glenn (1991) did however conduct a study in which generalisation was addressed. Three emotionally disturbed adolescents were covertly filmed in their classroom. Observation of the tape showed that students were off-task for 90% of the time when their teacher was out of the room. Similar behaviour also occurred when the students were walking, unattended, between classes. The
students then underwent social skills and self-management training. Training procedures included instruction, modelling, role playing of social skills and self-assessment, self-recording and self-rewarding for correct approximations of social skills. Results showed that the intervention was effective. Students increased their average time on-task from less than 14% during baseline to above 90% at the end of the study. One participant was so motivated to remain on-task during class when the teacher was out, that he did not even look up when another class member hit him on the head with a large wad of paper (Ninness, et al., 1991, p. 504).

However, the high level of appropriate behaviour did not generalise. Students were still behaving inappropriately when walking between classes. Once the researchers explicitly taught the students to apply their self-management procedures that they had learned in class to the between-class setting, inappropriate behaviour decreased.

This study shows that generalisation of behaviour occurred once the students had been taught the skills in the different settings. Educators should therefore plan self-management procedures and their maintenance and generalisation carefully.
Research Questions

There is much literature on the three separate areas of ADHD, token economies and self-management. However, little research has been done which investigates what happens when these three areas are brought together. The present study aims to fill this void by answering the following questions:

1. Does the implementation of a token economy system benefit students with attention problems or ADHD by increasing on-task behaviour and decreasing off-task behaviour?

2. Are children with attention problems or ADHD capable of managing their own behaviour through self-management of the token economy?

3. Does self-management of the token economy, as opposed to researcher management, improve the effectiveness of the token economy by increasing on-task behaviour?
Chapter 3
Method

This chapter describes the participants, research design, and materials involved in the study. The procedure followed when carrying out the study is also outlined. The chapter concludes with a discussion of the ethical considerations taken into account throughout the development and implementation of the research project.

Participants

Ben (pseudonym) was a Year 5 student in a suburban, middle-class Jewish primary school. At the time of the study, he was aged 9 years and 7 months, and was a student in a regular class. Ben was identified by his teacher as being of average intelligence. He scored a rating of "Low Severity" Attention Deficit Hyperactivity Disorder on the Attention Deficit Hyperactivity Disorder Test as completed by his teacher (Gilliam, 1995, see Appendix A). Ben had previously been diagnosed by a medical professional as having the disorder, and been prescribed medication. However, after a short time he stopped receiving treatment as it repressed his personality and was deemed unsuitable for him. For the duration of the study, Ben was not receiving any medication. Problem behaviours outlined by his classroom teacher included restlessness and fidgeting, interrupting others, failure to attend to or...
follow instructions, distractibility, and difficulty staying in seat and on-task. He also frequently rushed through written activities, producing “slap dash” work. According to the teacher, these behaviours were more likely to occur in the afternoon, and when any change to normal routine occurred. Ben’s teacher had tried strategies such as moving his seating position so that he was by himself, or next to a “responsible” class member. She had also tried talking to him. These strategies proved to be unsuccessful. Natural reinforcers applied by the teacher, such as praise were effective with other children in the class, but did not improve Ben’s behaviour.

The second participant, Sam (pseudonym), was a regular class Year four student. At the time of the study he was aged 9 years and 1 month old, and attended a middle-class suburban government school. Although not officially diagnosed as having attention deficit hyperactivity disorder, Sam was identified as displaying inattentiveness and distractibility. Other problem behaviours included difficulty taking turns, following directions, and completing tasks. These disruptive behaviours were more likely to occur when a change to normal routine occurred. Sam's teacher stated that he was a boy of average intelligence who had a willingness to do well at school and a positive attitude towards improving. However, his inappropriate behaviour and inattentiveness frequently prevented him from doing so. Sam also received a rating of "Low Severity" attention deficit hyperactivity disorder on the Attention Deficit Hyperactivity Disorder Test which his teacher completed
(see Appendix B). Ben displayed problem behaviours across settings. Previous strategies such as talking with the child about his behaviour and changing his seating position had failed to produce positive behaviour change.

**Design**

This study used a single-subject A B C D A' experimental design for each of the two participants. Phase A was the baseline condition; Phase B was a token economy managed by researcher; Phase C was a token economy managed by the participant; Phase D was the thinning of the reinforcers, still managed by the participant; and Phase A' was a return to baseline. Each phase consisted of ten 5-minute sessions. The dependent variable was time spent on-task. The single-subject research design was chosen for this study for three main reasons. Firstly, the single-subject design is best suited to the purposes of the study. As stated by Neuman and McCormick (1995), the aim of the single-subject research is to "clearly establish the effects of an intervention (that is, an independent variable) on a single individual. This describes accurately the purpose of the study, as individuals, rather than groups were being studied. Secondly, the research was to be conducted in the natural classroom setting of the participants. Single-subject research design was therefore appropriate as subjects are used as their own control, and no control group is needed. Also, the measurement procedures used in the design are natural to most classrooms (for example, observation). These two characteristics of the design allow
research to be carried out without interruption to the class (Neuman and McCormick, 1995).

**Instruments and materials**

The Attention Deficit Hyperactivity Disorder Test (Gilliam, 1995) is an instrument for identifying particular behaviours which cause problems for an individual child. The test gives a score of either Low, Average, or High severity of the disorder in that child. An adaptation of this was given to the class teacher to complete.

The following materials were used in the study. Audio equipment included two blank audio tapes, a personal tape recorder with ear phones, a small tape recorder, and four “AA” size batteries. Rewards and reinforcers consisted of coloured stars and pencils, rubbers, stamps and stickers. Forms and sheets used included a parent consent form (see Appendix C), a “project outline” form which was given to the teacher and parents of the participant, and the principal of the school (see Appendix D), and data collection sheets (see Appendix E and F). Other materials used in the study were one small exercise book, and 20 thin paper strips.

**Procedure**

Once parent, principal, and teacher consent had been gained, data collection began. All 50 sessions were conducted in the afternoon, during seatwork activities
in Ben's reading or health lessons, and Sam's social studies or mathematics lessons. Sessions were conducted across several weeks, with one, two, or three sessions conducted each afternoon depending upon the tasks set by the teacher each day. The sessions in each phase were conducted according to the following procedures.

Phase A: Baseline.

Before conducting the initial Baseline session, the classroom teacher was given the Attention Deficit Hyperactivity Disorder Test (adapted) to complete. The teacher then introduced the researcher to the class. The following was read to the class by the teacher:

Excuse me class, I would like to introduce you to Miss Ball. She is a student at Edith Cowan University, and is learning how to be a teacher. Now, she needs help and has asked me to find a child who would like to do some work with her and help her to learn how to be a teacher. Is there anyone here who would like to, or thinks they would be able to help Miss Ball?

The child who had been selected for the study was then called upon, whether or not he had his hand up, and taken aside by the researcher (Ben did not put up his hand, Sam did). The child was told what would be happening:
Thank you for helping me, (name). We will be playing some games a bit later on, but for a few days, I am just going to sit over here (researcher points to a position at the side of the classroom from which the child can be observed), and watch what happens in your classroom. Go back to your desk now and continue with your work.

Session one was then conducted. Using a momentary time-based sampling, the child’s behaviour was observed and recorded as either "on-task" or "off-task" (defined below). A behaviour was recorded once every 30 seconds on average, for 5 minutes on a variable interval schedule. Ten data points were gathered for each session. An audio tape with pre-recorded tones sounding every 30 seconds on average (variable interval schedule) for 5 minutes was played through ear phones to alert the researcher as to when to observe and record behaviours. The behaviour being performed by the student as the tone sounded was recorded as on-task or off-task on the data collection sheet.

An off-task behaviour was recorded if the child was:

- talking (not task related),
- scribbling,
- fiddling with objects on the desk,
- looking around the room, watching others.
An on-task behaviour was recorded if the child was:

- completing a set task,
- following instructions given by the teacher,
- asking the teacher a question,
- answering a question issued by the teacher,
- asking a task-related question to a class member,
- answering a task-related question for a class member.

The participant was always recorded as either on-task or off-task; there was no third category. Sessions 2-10 in this phase were conducted in the same way as Session 1. However, no discussion was held with the participant at the beginning of the sessions, as was the case in Session 1. At the conclusion of Session 10, the researcher asked the participant about his likes/dislikes, interests, and hobbies in order to establish what reinforcers would be appropriate. Reinforcers were chosen accordingly. All sessions were conducted in the afternoon as this was the time when problem behaviours were more likely to occur.
Phase B: Token economy managed by researcher.

In the second phase of the study, the intervention was introduced. Before session eleven was conducted, the child was taken aside with the researcher, and the intervention - a token economy - was explained.

Okay (name), today in class, I am still going to sit over here (same position as during baseline), but we are going to play a little game. I will be listening to a tape through ear phones that has a little bell ringing on it every now and then. Every time the bell rings, I will look at you and see what you are doing. If you are doing your work quietly, and following the instructions your teacher gave you, or asking a question, I will put a tick in one of these boxes on a ladder (Show child exercise book which has ladders of ten rungs drawn in, with an arrow pointing to the eighth rung). But if you are talking to someone, playing with something on your desk, looking around the room, scribbling or sharpening a pencil that’s not blunt, I will not give you a tick. If you get ticks all the way up to the arrow, I will give you a star, and you can come and choose something from this prize box (show child prize box). If you don’t get ticks all the way to the arrow - you won’t get a star, and you won’t be able to choose anything. Do you understand? Do you have any questions? Can you tell me why you get ticks, and how many ticks you need to choose a prize? (Both children answered correctly). Okay - off you go back
to your desk now. I will tell you when it is time to come over and choose something.

Behaviours were then observed and recorded in the same way as during the baseline condition. However, each time an off-task behaviour was recorded, the actual behaviour being performed was also recorded. For sessions 12-20, no discussion was held with the child before the session. The child was called over at the end of the observation period to choose rewards (if earned).

**Phase C: Token economy managed by the participant.**

In Phase C of the study, the intervention was slightly altered. The token economy was managed by the participant instead of the researcher. The participant became responsible for awarding himself ticks for on-task behaviour. The following discussion took place before an initial "practice" session was conducted.

Hello (name). Now we are going to change our game a little bit. We are going to go onto stage two, the next level of the game. You will be listening to the tape instead of me. We will put this little tape recorder on your desk, and this ladder (strip of paper with ladder drawn on). Each time you hear the bell ring - you quickly give yourself a tick if you are doing your work. If the bell rings and you are talking, or playing with something on your desk, or playing with the tape recorder, do not give
yourself a tick. If you get ticks all the way up to the arrow, you may choose something from the box. I will be listening to the tape and watching as well, so if you're not sure whether to give yourself a tick or not, I will help you. We will have a practice game first to make sure you know what to do. Off you go back to your desk, I will put the tape recorder and ladder strip on your desk when it is time to start.

Sessions 21-30 were conducted after a "practice" session took place (which was not included in the results). Each session commenced with the placing of the tape recorder and ladder strip on the child's desk. Figure 3 shows how the child's desk was set up. The 'play' button was pressed simultaneously on the child's and the researcher's tape recorders, and each played a recording of exactly the same variable interval schedule of tones. The volume of the child's tape recorder was sufficiently low so as not to disturb other students. Rewards (if earned) were chosen at the end of the observation period. Data were recorded by the researcher using the same data collection sheet as in Phase B.

A - Personal tape recorder,  B - Paper Strip.
Figure 3: Photograph of child's desk arrangement during intervention.
Phase D: Thinning of the reinforcers.

During Phase D, the reinforcers were thinned so as to fade out the intervention. Management of the token economy by the participant continued. However, rewards could be gained only after every second successful session. Instead of being reinforced every time eight or more ticks per session were achieved, the participant received reinforcement every second time eight or more ticks per session were achieved. The following passage explained this change to the participant before session 31 commenced.

You have been working so well (name), so now we are going to go onto the next stage of the game - level three. You will be listening to the tape and giving yourself the ticks, but instead of choosing a prize every time you get eight or more ticks on the ladder, you can choose a prize when you get two ladders with eight or more ticks on (show child two ladders with eight or more ticks on). So - you need to fill two ladders instead of just one before you can choose a prize. Do you understand? Do you have any questions? (Child had no questions). Off you go back to your desk now, I will call you when it is time to choose something.

Sessions 32-40 were conducted without any discussion held before the session. Data were collected in the same manner, and using the same data sheet as in Phases B and C. Rewards were chosen at the end of the observation period.
**Phase A': Return to baseline.**

This final phase was conducted under the same procedure as the initial Phase A. The researcher told the participant before session 41 that:

> For a few days, I am just going to sit over here (point to position at side of classroom from which child can be observed), and watch what happens in the classroom. Go back to your desk now and continue with your work.

Behaviours were recorded using the same data sheet as used in Phases B, C and D. No discussion was held with the child before session 42-50, or after sessions 41-49. After the completion of the final session, the researcher thanked the participant, teacher, and class for helping out and allowing the researcher to learn in their classroom.

Inter-rater reliability was calculated during sessions 41 and 42 for Sam. An independent rater (a fellow Honours student) was given a personal tape recorder, a tape with the tones recorded on it and data collection sheets. After explanation of procedures and behaviours involved, the researcher and the independent rater then observed the participant and recorded on- and off-task behaviours. Inter-rater reliability was at 100% during session 41, and 90% during session 42.
Ethical considerations

Several steps were taken in order to ensure that the study was ethically acceptable and respectful of the rights of all involved. The Postgraduate Committee in the School of Teaching and Learning reviewed the study and granted permission for it to commence before any contact with participants was made. Parent, principal and class teacher permission was obtained after the study was outlined and explained to them before any data were collected. Pseudonyms have been used throughout all documentation of the study so as to ensure that the confidentiality and privacy of all involved were preserved. The participants showed no signs of feeling embarrassed, or "singled out" as a result of the intervention. Other class members were curious about the prizes the boys chose. However, they did not tease them, or cause any anxiety in the participants because of their involvement in the study.
Chapter 4
Results

Participant one: Ben

On-task behaviour

The data from the study show that the intervention was successful at increasing Ben's time on-task. Figure 4 shows Ben's results. The data points represent the number of intervals per session that Ben was recorded as displaying "on-task" behaviour.

Figure 4: Ben's on-task behaviour in each phase.

During the baseline phase, Ben was recorded as on-task for 49 out of a
possible 100 intervals. This means that he was on-task for 49% of the time that he was being observed. It can be seen in Figure 4 that Ben’s behaviour was quite variable during baseline as he was on-task for 20% to 60% of the time (range = 4). The researcher observed that Ben was more likely to be off-task when he was working on a task that he found to be difficult, and when he was not sure of what to do. This may explain his variable behaviour, as different sessions were conducted during different lessons when Ben was completing different tasks.

Phase B saw the introduction of the intervention - a token economy. Ben’s behaviour quickly improved as he spent more time on-task during this phase. The mean number of intervals recorded as on-task increased to 8.1 per session. Ben spent 81% of the observation time on-task, an increase of 32% from phase A. Variability did not decrease in this phase, as behaviour still produced a range of 4. There was no overlap between phase A and B, indicating that Ben responded quickly and positively to the intervention.

As Figure 4 shows, behaviour improved still further in Phase C, when self-management of the token economy was established. Ben was on-task for 94% of the observation time. This was the highest level of all five phases. Variability of behaviour decreased during this phase, with the range of behaviour decreasing from 4 in previous phases, to 2. Researcher’s observations and comparison of Bens’ self-monitoring and the researcher’s data collection sheets show that Ben accurately
awarded himself ticks for being on-task.

In some instances, he was not sure whether he deserved a tick or not, and he would glance at the researcher. The researcher would then indicate whether or not he did.

During phase D, the reinforcers were thinned, while self-management of the token economy continued. Ben's mean number of intervals on-task dropped slightly from 9.4 in phase C, to 9. He was on-task for 90% of the observation time in this phase. Variability of behaviour remained the same as in phase C (range = 2). Behaviour in this phase was similar to that in phase C. However, towards the end of phase D, Ben became reluctant to perform the self-monitoring, and asked at the beginning of sessions 38, 39, and 40 if I (the researcher) could listen to the tape and award Ben the ticks instead of him doing so. I told him that he only had to do it himself for a few more days, and that he was working very hard and doing so well. After this encouragement, he proceeded to monitor himself for the final sessions of the phase.
Phase A' was a return to baseline condition. All interventions and rewards were withdrawn. Ben's time on-task dropped immediately, and his mean number of intervals on-task decreased to 5.7 per session. During this phase, he was on-task for only 57% of the observation time. His behaviour became more erratic, and increased in variability. With a range of 7 (from 2 - 9), this phase produced the most variable results.

**Off-task behaviours**

Figure 5 shows the number of intervals per session that Ben was recorded as displaying the off-task behaviour of talking.

Figure 5: Number of intervals per session that Ben was recorded as talking.
Off-task behaviours were recorded, but not categorised, during the baseline phase. During this phase the researcher was observing the child so as to determine the behaviours which would be recorded as "off-task" for the particular child. All behaviours during baseline were recorded as either "on-task" or "off-task". For phases B, C, D, and A', behaviours were recorded as either on-task, or talking to another classmate, manipulating (fiddling with) objects, or looking around the room. It can be seen in Figure 5 that Ben rarely performed the off-task behaviour of talking during the intervention phases (B,C,D). The mean number of intervals for which Ben was recorded as talking was 0.1 for phase B, 0.2 for phase C, and 0.3 for phase D. However, once the intervention was withdrawn, this behaviour increased. During phase A', Ben's mean number of intervals recorded as talking increased to 2, and variability also increased (range = 6).

A similar pattern of behaviour occurred with the other off-task behaviours of looking around the room and manipulating (fiddling with) objects. These are shown in Figure 6. It can be seen that Ben's mean number of intervals recorded as looking around the room was quite low for phases B, C and D. Although the mean did not increase when the intervention was withdrawn, variability of behaviour increased significantly, from ranges of 3, 1, and 2 in phases B, C and D to a range of 5 during baseline.

This same pattern occurred with the off-task behaviour of fiddling with objects, as can be seen in Figure 6. After low means during phases B, C and D (0.7,
Ben's mean number of intervals recorded as manipulating/fiddling with objects increased to 1.1 per session during baseline.

Figure 6: Number of intervals per session that Ben was recorded as looking around the room and manipulating/fiddling with objects.
Participant two: Sam

On-task behaviours

Data from the study show that the intervention implemented was effective in increasing Sam's time on-task and decreasing his off-task behaviours. Figure 7 shows Sam's results. The data points represent the number of intervals per session that Sam was recorded as being "on-task".

Figure 7: Number of intervals per session that Sam was on-task.
During baseline, Sam was on-task for 47% of the time (on-task for 47 out of a possible 100 intervals in the phase). His level of on-task behaviour was at the lowest during this phase. Sam's behaviour produced a range of 2, from 4-6, indicating low variability.

In phase B, the intervention was introduced. This produced an immediate and significant improvement in Sam's behaviour. His mean number of intervals on-task per session increased to 8.8. Although behaviour was slightly more variable in this phase, (range = 3), there was no overlap between this phase and phase A, as behaviours ranged from 4-6 in phase A, and from 7-10 in this phase. Sam responded extremely well to the intervention, as his time on-task increased from 47% to 88% when it was implemented.

Phase C involved the participant managing the token economy himself. During this phase, variability of behaviour decreased (range = 1) and Sam's behaviour ranged between 9 and 10. His time on-task increased to 96%. During phase D, when the intervention was faded, his time on-task and variability of behaviour remained the same as in phase C. Sam was able to monitor his own behaviour accurately. He awarded himself ticks for being on-task, and did not when he was off-task. He also stated that he enjoyed giving himself ticks, and that it helped him to “work better”.

In phase A', the intervention and the reinforcers were withdrawn, and a return to baseline conditions occurred. Sam's time on-task dropped slightly to 88%, a
decrease of 8% from the previous phase D. Variability of behaviour increased slightly (range = 2), with behaviours ranging from 8 - 10. This was the same level of variability as in phase A, however, as seen in Figure 7, time on-task was much higher during phase A' than in phase A.

**Off-task behaviours**

Data were also gathered on Sam's off-task behaviours. These included talking to another classmate (non task-related), looking around the room (daydreaming, watching others), and inappropriate manipulation of objects (fiddling with pencil/rubber/tape recorder). As can be expected, these behaviours decreased as Sam's on-task behaviour increased.

Figure 8 shows the number of intervals per session that Sam was recorded as talking to another classmate. It can be seen that Sam rarely talked during the intervention phases (B, C ,D). During phase B, Sam was recorded as talking for only six intervals during the whole phase, for only three intervals during phase C, and only two intervals during phase D. In phase A', when a return to baseline occurred, this off-task behaviour slightly increased to a mean of 0.8, from a mean of 0.2 in the previous phase. Variability was the same for phases B and A' (range = 2), and the same in phases C and D (range = 1).
Figure 8: Number of intervals per session that Sam was recorded as talking.

Data were collected for the behaviours of looking around the room and fiddling with objects. Figure 9 shows the data for these off-task behaviours. It can be seen that Sam's level of off-task behaviour was very low during phases B, C, and D. When the intervention was withdrawn in phase A', these behaviours remained very low. Sam was "fiddling with objects" for 3% of the time in phase A’, and looking around for only 1%. These low levels of off-task behaviour during the return to baseline conditions suggest that maintenance occurred.
Figure 9: Number of intervals per session that Sam was recorded as fiddling or looking around.
Summary

The results show that both participants responded positively to the token economy intervention. On-task behaviour increased and off-task behaviour decreased in both cases as soon as the token economy was established. The introduction of self-management procedures further increased the level of on-task behaviour in both participants. Self-management of the token economy, as opposed to researcher management, increased the effectiveness of the economy. Sam maintained the high level of on-task behaviour once the interventions were withdrawn. Ben, however, did not. His level of off-task behaviour increased during phase A'. The study shows that students with attention problems are capable of managing their own behaviour, and that in doing so, their off-task behaviours are decreased.
Chapter 5
Discussion

This chapter discusses the results of the study. The research questions of the study are answered, and the results of the study are discussed in relation to previous studies. Implications for further research, and limitations of the study are also given throughout this discussion. The chapter concludes with an outline of implications for classroom practice resulting from the study.

Effect of token economy on behaviour

The results of the study provide answers to the research questions which were stated in chapter 2. The first research question asked "Does the implementation of a token economy system benefit students with attention problems or ADHD by increasing on-task behaviour and decreasing off-task behaviour?" Data from the study show that the answer to this question is "Yes." As seen in Figures 4 and 7, on-task behaviour in both participants increased significantly as soon as the token economy was established. These high levels of on-task behaviour were maintained in phases B, C, and D when the token economy was in place. Average time on-task for these 3 phases was 88% for Ben and 93% for Sam.

Other research studies have also demonstrated such immediate and significant improvements with the establishment of a token economy system. In a study by
Shook, LaBrie, and Vallies (1990), 3 regular class Grade 1 students reduced their number of inappropriate behaviours from means of 13, 11, and 22 during base line to 0.7, 1.9, and 0.0 during the token economy condition. Robinson, Newby, and Ganzell (1981), investigated the effects of a token economy on task completion of hyperactive children. Results of the study once again demonstrate immediate positive effects of the token economy on behaviour. Students completed 9 times as many assignments when working under the token system than when the token system was removed.

The present study shows that token economies are effective in increasing on-task behaviour of students with attention problems and ADHD. Although such children experience great difficulty attending to tasks, there are strategies which help them to do so more effectively. The Diagnostic and Statistical Manual for Mental Disorders states that symptoms of ADHD such as inattention and fidgeting "may be minimal when the person ... experiences frequent rewards for appropriate behaviour" (1994, p. 79). The token economy is one strategy that considers this, as students are rewarded with reinforcement (a token) every time the appropriate behaviour occurs. The importance of reinforcement for appropriate behaviour is also advocated by Skinner. He wrote that in order to generate appropriate behaviour it is "not enough" to merely suppress inappropriate behaviour (1969, p. 149). Results from the current study show that by reinforcing students with attention problems for being on-task, their inattentive behaviours decreased and their on-task behaviours increased.
When implementing the token economy system, teachers need to consider the individual needs of the students for the strategy to be effective. In this case the strategy was effective for the two particular students involved. Further research could investigate the effects of token economy on the behaviour of children who have a more severe case of ADHD, or who are on medication. A limitation of this study is that it was confined to participants who were of Low Severity ADHD according to the attention deficit hyperactivity disorder test (Gilliam, 1995). Anderson and Katsiyannis (1997) conducted a study involving the use of a token economy in a regular class which contained four students with behaviour disorders. The token economy was successful in decreasing the frequency of disruptive behaviours. Many studies such as this one, have been conducted which demonstrate the effectiveness of the token economy. However, further research of this strategy and its effect on ADHD children would enable teachers to better assist such children to overcome their attention problems.

**Self-management ability**

The second research question sought to determine whether or not students with attention problems were capable of managing their own behaviour through self-management of the token economy. Self-management of the token economy was introduced in phase C, and continued onto phase D of the study. Results from these phases and observations from the researcher demonstrate that students with attention
problems are capable of performing self-management procedures. Both participants in the study were able to listen to the tones on the tape recorder and award themselves a tick for being on-task, thus performing the skill of self-monitoring. Both Ben and Sam monitored themselves accurately. When their records were compared with the researcher's, no discrepancies were found. If, at any time, the boys were unsure of whether or not to award themselves a tick, they glanced at the researcher who then assured them of what to do. However, this rarely occurred. The boys also performed the skill of self-rewarding accurately. At the end of each observation period, they chose the appropriate number of rewards from a selection of reinforcers.

Previous studies have also shown that children are capable of self-management. Students as young as 4 years of age have successfully managed their own behaviour. A study by Workman, Helton and Workman (1982) involved a regular class 4-year-old boy monitoring his own on-task behaviour. The self-monitoring procedure of marking a sheet if he was on-task when a timer sounded every five minutes was used. This increased his on-task behaviour from 37.73% during baseline to 63.66%. Another study involved four "distractible" students aged 10 to 16 years using self-monitoring (Osborne, Kosiewicz, Crumley & Lee, 1987). Their teacher role-played attentive and non-attentive behaviours and self-monitoring of these behaviours whenever a tone was emitted from a tape recorder. The self-monitoring procedure increased the attentive, on-task behaviour in all students.
Many studies have used this self-monitoring procedure which involves students recording their behaviour as a tone from a tape recorder/timer sounds. It has been found to be effective in many cases, and as in the present study, does not disrupt other class members (Osborne, Kosiewicz, Crumley & Lee, 1987). In the present study, as well as many others, the procedure has produced positive behaviour change. As stated by Gardill, DuPaul and Kyle (1996), the action of simply becoming aware of and recording a behaviour such as paying attention, can increase the frequency of that behaviour. A limitation of the present study is that it did not investigate the effects of self-management alone on behaviour. Further research could look at the effect of self-management on behaviour without the use of reinforcement.

When implementing a self-management program, teachers must take care to plan it carefully. Students must be aware of the behaviours and procedures involved so that accurate self-management can occur. Although training the students may be time-consuming, the positive results that can be achieved are worth that time and effort. The teacher also needs to consider how accuracy checks of the students' self-management can be carried out. This can be done by comparing the students' and teacher's data collections sheets, or observation of the students. Also, whether the strategy is to be implemented on a whole class basis, or just with the individual.

The present study shows that children with attention problems are capable of managing their own behaviour through self-monitoring and self-rewarding. The
procedure used in the study, involving the tones from the tape recorder, has been found to be effective in many cases. It is also a procedure which allows children to become more independent and responsible for their own behaviour, as minimal teacher supervision is required (once training has been carried out). The procedure is also beneficial to teachers, as it enables them to work with small groups of children while the rest of the children in the class monitors their own behaviour (Osborne, Kosiewicz, Crumley & Lee, 1987).

**Effect of self-management on behaviour**

The final research question addresses the effect that self-management of the token economy (as opposed to researcher management) has on behaviour. The data from the present study show that when the participants monitored and rewarded themselves, rate of on-task behaviour was highest (phases C and D). Self-management therefore increased the effectiveness of the token economy, as rate of on-task behaviour was almost 100% during self-management phases for both participants.

A study by Glynn, Thomas and Shee (1973) produced similar results. Students in a regular class Grade two classroom participated in the study. The teacher of the class had established a token economy, which she found to be effective except during reading lessons. During reading, she worked with small groups of children at a time and found that it was difficult to award tokens to the rest of the class, who
consequently became disruptive. The researchers then introduced self-management of the token economy. Students who were not working with the teacher were taught to mark on a grid if they were on-task when a beep from a tape recorder sounded. Students rewarded themselves with one minute of free time before recess for each mark on the grid (maximum of 10 minutes per day). The self-management procedure increased the effect of the token economy, as on-task behaviour increased.

Self-management is effective because it enables students to become aware of what behaviour they are performing, and how often they are performing them. This is particularly important for children with attention problems who may not always be aware that they are off-task. Self-management gives students the opportunity to become responsible for their own behaviour, and to be the agent of change of their behaviour. In this way, the child's attention is drawn away from the short-term consequences of off-task behaviour, and toward the long-term consequences of being on-task. For example, a student displaying disruptive behaviour may receive immediate attention from peers/teacher for doing so, and aversive consequences much later. Self-management helps students to keep in mind the long-term consequences for being on-task - positive reinforcement and increased learning and achievement (Wolery, Bailey & Sugai, 1988).

Sam found the self-monitoring to be very reinforcing. He stated that he liked giving himself the ticks, and that it helped him to "work better". Ben was also very enthusiastic about the self-monitoring when it was first introduced. However,
towards the end of the study, he became reluctant to monitor himself and requested that the researcher manage the token economy. After encouragement from the researcher this problem was overcome. In order to prevent this situation from occurring, teachers can take the following steps. Firstly, the types of rewards can be changed. For example, introduce favourite activities into the selection of rewards, so that the incentive to remain on-task is "renewed". Secondly, teachers can also change the reinforcement schedule. In this way the number of tokens required to earn a reward is altered, and interest in the task of self-monitoring is maintained.

The present study demonstrated that when students with attention problems manage their own behaviour, level of on-task behaviour is very high. By taking the responsibility of managing the token economy from the researcher and placing it on the student with attention problems, disruptive behaviours decrease and remain at a very low level.

**Maintenance**

Maintenance of behaviour is an important issue in educational research. In the present study, maintenance of high levels on-task behaviour was achieved with one of the two participants, Sam. However, Ben did not achieve maintenance of behaviour. His level of off-task behaviour increased as soon as the intervention was withdrawn. This suggests that some students with attention problems require some sort of guidance (self-managed or otherwise) to remain on-task, as in Ben's case.
The literature on maintenance of behaviour after token economies strategies have been withdrawn in mixed, as are the results of this study. Some studies have achieved maintenance of behaviour (Shook, LaBrie & Vallies, 1990; O'Leary, Becker, Saudargas & Evans, 1969), once the token economy was withdrawn. Other studies have not (Robinson, Newley & Ganzell, 1981). Many studies involving self-management do not measure maintenance of behaviour. However, Workman, Helton and Watson's study with the 4-year-old boy (1982) show that he did not maintain behaviour once the self-management procedure ceased.

It should be noted, however, that phase A' of the present study was conducted during the final week of the school term for Ben. This may have affected the validity of the study. Normal routines were disrupted, and data were gathered during atypical lessons (for example, finishing off work and special activities). This may have contributed to Ben's increase in off-task behaviour because, as stated earlier, he was more likely to be off-task when normal routines were disrupted. Future research could investigate ways in which to promote maintenance of self-management skills. For example, thinning of procedures, varying training, and overlearning (Wolery, Bailey & Sugai, 1988, p. 299).
Single-subject design

The present study used a single-subject experimental design. Therefore, only two participants were involved. Future studies conducted with larger numbers of students could further provide information about token economies, self-management and children with attention problems. It should be noted, however, that the researcher experienced great difficulty in finding students diagnosed with ADHD but not receiving medication. This was due to the fact that parents are not obliged to inform the school that their children have ADHD unless they are receiving medication which must be administered at school. Many parents of children with ADHD (not on medication) were not willing to allow their child to participate in this study because it meant that teachers, students and other parents may find out that their child had the disorder. In this way, ADHD is a "hidden disability" in our community.

The two participants in the study responded to the interventions in a similar manner. Both were enthusiastic about earning tokens and rewards and consequently their on-task behaviour increased. Both participants also responded positively to the self-management procedures. They welcomed the opportunity to monitor and reward themselves, and in doing so their level of on-task behaviour further increased. Sam, however produced slightly higher levels of behaviour than Ben throughout the entire study. Sam also maintained that high level during the return to
baseline condition (88% on-task during phase A'), while Ben's level of on-task behaviour dropped (57% on-task during phase A').

Single-subject designs are based on the assumption that each participant is an individual, and is expected to react differently to interventions to some degree. This realisation that all children are different, and therefore require individualised interventions is one of the principles of behaviour management and must be considered when planning behaviour change programs (Zirpoli & Melloy, 1997).

The interventions used in the present study were effective in improving the behaviour of the two participants involved. However, because each child is different, one cannot say that these results can be generalised to other children. It is possible that other students with attention problems would not respond as positively to the intervention as Ben and Sam did. The results of the study do show that the interventions were successful, and that students with attention problems can be taught to monitor and reward themselves. The data demonstrate that the token economy and self-management were effective alternatives to medication in the cases of Ben and Sam.

**Implications for classroom practice**

The results of the study provide information for teachers of students with ADHD or attention problems. It can be seen that the behaviour management strategies of token economy and self-management were effective in increasing time
spent on-task. These positive results are of particular relevance in Western Australia, because, as stated earlier, approximately 5% of 4- to 11-year olds in this state have significant attention problems which contribute to below average academic competence (Zubrick, et al., 1997). Apart from producing positive behaviour change, the strategies used in this study have three major advantages relating to classroom practice.

Firstly, both the token economy and the self-management systems can be established quickly, economically, and simply. Students require only a brief, but clear, explanation of how the systems work, and a practice session ensures that all are aware of the behaviours, rules, reinforcers that apply. Reinforcers are not expensive or difficult to obtain. They can take the form of free time, special activities, or a lucky dip, and are highly effective if chosen carefully, after consideration of the students' interests and needs.

Secondly, the self-management strategy encourages independence and develops important life skills such as self-monitoring. Students learn to become accountable to themselves, and the intrinsic value of learning is emphasised once the token economy is faded completely out. Self-management enables students and teachers to work towards the ultimate goal of education, which is that students will be able to function effectively without teacher- or adult-mediated control.

Thirdly, self-management provides a means of giving non-intrusive guidance to students with attention problems. Many students with ADHD or attention
problems require some sort of guidance to remain on-task. As seen with the participants in this study, natural reinforcers such as teacher praise, which are effective for other peers in the class, are not necessarily successful for students who have attention problems. The strategies of token economy and self-management allow teachers to guide the behaviour of students non-intrusively, and gradually the students become responsible for their own behaviour (Wolery, Bailey & Sugai, 1988).

Teachers in Western Australian schools who have students with attention problems in their care can take the results of this study and apply them in their own classrooms. Through careful consideration of student needs and interests, the token economy and self-management strategies can be individualised to suit any child and many behaviour problems.
References


Appendix A
Identifying Problem Behaviours
(To be completed by class teacher).

Date: 28-4-97

Child's Name: Ben

Child's date of birth: 13-10-1987

DIRECTIONS: Please indicate which of the following behaviours/characteristics are a problem for this individual. Circle 0 if the behaviour is not a problem, or if you have not had the opportunity to observe the behaviour. Circle 1 if the item refers to a behaviour that is a mild problem. Circle 2 if the behaviour is a severe problem for this individual.

HYPERACTIVITY SUBTEST

1. Loud
2. Constantly "on-the-go"
3. Excessive running, jumping, climbing
4. Twisting and wiggling in seat
5. Easily excited
6. Grabs objects
7. Excessive talking
8. Difficulty remaining seated
9. Constantly manipulating objects
10. Inability to play quietly
11. Fidgets
12. Restless
13. Squirms

IMPULSIVITY SUBTEST

14. Acts before thinking
15. Shifts from one activity to the next
16. Fails to wait for one's turn
17. Difficulty waiting turn
18. Blurt out answers
19. Impulsive
20. Interrupts conversations
21. Intrudes on others
22. Does not wait for directions
23. Fails to follow rules of games
INATTENTION SUBTEST

24. Poor concentration 0 2
25. Fails to finish projects 0 2
26. Disorganized 0 2
27. Poor planning ability 0 2
28. Absentminded 0 2
29. Inattentive 0 2
30. Difficulty following directions 0 2
31. Short attention span 0 2
32. Easily distracted 0 2
33. Difficulty sustaining attention 0 2
34. Difficulty staying on task 0 2
35. Difficulty completing tasks 0 2
36. Frequently loses things 0 2

Key questions
1. Does the person exhibit the behavioural problems in a variety of environments? Which environments? Learning in the classroom is most noticeable. It is also the work break, at 9, 10, 11, 12, is lots of noise and activity in the room as he becomes excited.
2. Has the person demonstrated the behaviours for at least six months? Yes
3. Is the person's functioning (at home or school) significantly impaired? Nutritional
4. Are there other conditions that could possibly be causing the behaviours? If yes, what are they? None, what they have mentioned in 1.
5. Has anyone previously evaluated the person and what were the results? Yes, the person was previously evaluated, and at one time, written work may be "speedy-dash."
6. What specific interventions have been attempted to treat the person's problems?
The medication was deemed unnecessary in this case, as his personality has improved and menstruated.
7. Any additional information? He is well informed on a range of topics and participates in many oral activities. He seems to process verbal instructions in pieces.

Thank you for your time.
(Adapted from ADHDT - Attention-Deficit/Hyperactivity Disorder Test, 1995 PRO-ED). Complete confidentiality of the information given above is ensured. Pseudonyms will be used when results are documented).

Any queries - please contact Renee Ball on (home) or (work) - till 1 pm daily).
Appendix B
Identifying Problem Behaviours
(To be completed by class teacher).

Date: 20. 1. 97

Child's Name: Sam

Child's date of birth: 7-8-88

DIRECTIONS: Please indicate which of the following behaviours/characteristics are a problem for this individual.
Circle 0 if the behaviour is not a problem, or if you have not had the opportunity to observe the behaviour.
Circle 1 if the item refers to a behaviour that is a mild problem.
Circle 2 if the behaviour is a severe problem for this individual.

HYPERACTIVE CHARACTERISTICS

1. Loud
2. Constantly "on-the-go"
3. Excessive running, jumping, climbing
4. Twisting and wiggling in seat
5. Easily excited
6. Grabs objects
7. Excessive talking
8. Difficulty remaining seated
9. Constantly manipulating objects
10. Inability to play quietly
11. Fidgets
12. Restless
13. Squirms

IMPULSIVE CHARACTERISTICS

14. Acts before thinking
15. Shifts from one activity to the next
16. Fails to wait for one's turn
17. Difficulty waiting turn
18. Blurs out answers
19. Impulsive
20. Interrupts conversations
21. Intrudes on others
22. Does not wait for directions
23. Fails to follow rules of games

Circle 1

2
INATTENTIVE CHARACTERISTICS

24. Poor concentration 0 0 2
25. Fails to finish projects 0 1 2
26. Disorganized 0 1 2
27. Poor planning ability 0 1 2
28. Absentminded 0 1 2
29. Inattentive 0 1 2
30. Difficulty following directions 0 1 2
31. Short attention span 0 1 2
32. Easily distracted 0 1 2
33. Difficulty sustaining attention 0 2
34. Difficulty staying on task 0 1 2
35. Difficulty completing tasks 0 1 2
36. Frequently loses things 0 1 2

Key questions
1. Does the person exhibit the characteristics in a variety of environments? Which environments?
   Yes

2. Has the person demonstrated the characteristics for at least six months?
   Yes

3. Is the person's functioning (at home or school) significantly impaired?
   No

4. Are there any other conditions which may be causing the characteristics? If so, what are they?
   No

5. Has anyone previously evaluated the person and what were the results?
   No

6. What specific interventions have been attempted to treat the person's problems?
   Talking to him.

7. Any additional information?
Thank you for your time.

(Adapted from ADHDT - Attention-Deficit/Hyperactivity Disorder Test, 1995 PRO-ED). Complete confidentiality of the information given above is ensured. Pseudonyms will be used when results are documented)

Any queries - please contact Renee Ball on 1 pm daily).
Appendix C
Dear ____________________________.

My name is Renee Ball. I am currently studying for a Bachelor of Education Honours degree at Edith Cowan University.

I would like to invite your child to participate in my project. During the project I will use a simple reward system to encourage the children to perform well on classroom tasks. I aim to determine whether this strategy improves social behaviours. If you have any queries at all, please do not hesitate to contact me and I will clarify them for you.

If at any point during the project you should wish to withdraw your child, please let me know and any data already collected will be destroyed.

I must have permission from you for your child to participate in my project. Please fill out the details below if you wish to grant that permission.

Thank you for your time,
Sincerely,

Renee Ball.

(You may contact me on the above number after 1pm daily. My work number is 9424-6463).

-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Renee Ball,

I __________________ fully understand my child's role as a participant in your research project and give my informed consent for the project to commence.

Signed: ________________________.

Date: ____________________________.
Appendix D
OUTLINE OF PROJECT

My research project targets on-task behaviours in children who display attentional or concentration problems, or who are diagnosed as having attention deficit hyperactivity disorder and are not on medication. The project aims to trial two strategies and prove their effectiveness in improving classroom concentration.

Once permission has been granted by parents, principal and teacher for the project to commence, the child will be selected from the class in a way that does not single him/her out. The teacher will introduce the researcher as a student at university who is learning to be a teacher, and who needs some help in doing so. The teacher will ask the class for volunteers to help, and the selected child will be called upon.

The project will be carried out in five stages. In each stage, there will be ten 5-minute sessions. (3-4 sessions will be conducted per visit to the class).

**Stage 1:** Observation only of the child's behaviour during class. A behaviour will be recorded once every 30 seconds for five minutes as either on-task or off-task.

**Stage 2:** Behaviour will be observed as in stage one, but the intervention will be established. I will explain to the child what will be happening. I will draw up a chart, and each time I record an on-task behaviour, I will put a star on the chart. Once the child has earned say, seven stars, s/he then can choose from a range of small reinforcers/rewards. (For example - pencil, rubber, sticker).

**Stage 3:** Same procedure as in stage two, but the child will be responsible for awarding her/himself the stars.

**Stage 4:** Same procedure as in stage three, but the number of stars needed to gain a reward will increase so as to fade out the rewards.

**Stage 5:** Behaviours will once again be observed as in stage one.

A follow-up observation-only, 5-minute session will be conducted approximately four weeks after the study has been completed.

If you have any queries please contact me in:
Appendix E
Data collection sheet for phase A

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Appendix F
Data collection sheet for phases B-A'

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