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AN EVALUATION OF FUNCTIONAL ASSESSMENT OF THE  
BEHAVIOUR OF STUDENTS WITH ADHD IN A  
MAINSTREAM CLASSROOM

A thesis

submitted in partial fulfilment

of the requirements for the degree

of

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by

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## **Abstract**

The overall aim of this study was to replicate and extend Hoff, Ervin, and Friman (2005) and to investigate whether a functional assessment, including the intervention, could be implemented within a mainstream New Zealand classroom, with students diagnosed with Attention Deficit Hyperactivity Disorder, and with the teachers implementing the interventions. Experiment 1 included 2 participants, Joel diagnosed as Attention Deficit Hyperactivity Disorder, and Brad who met study inclusion criteria. Descriptive assessments (based on interviews and observations) of the functions of the target behaviours were conducted to produce hypotheses. Two interventions for each student, based on these hypotheses, were selected in collaboration with the class teachers. The interventions were implemented, first singularly and then in combination, using a multiple-baseline design with alternating treatments after the baseline period. They all decreased target behaviours to some degree. One intervention, the token economy, was the most effective with both students. Social acceptability questionnaires showed all procedures were acceptable but of the interventions the token economy was the least favoured by teachers and most favoured by students. Both participants in Experiment 2 were diagnosed with Attention Deficit Hyperactivity Disorder. Experiment 2 replicated Experiment 1 and also compared hypotheses about the function of behaviour resulting from the Motivation Assessment Scale to those from the descriptive assessment as used in Experiment 1. The Motivation Assessment Scale provided a different hypothesis for one student and it is suggested that this scale is not useful with these students. The two interventions were selected for each student based on the hypotheses. These were designed to be easier to implement and to have more student involvement in their implementation than in Experiment 1. A multiple-baseline design with alternating treatments after the baseline was used and each treatment was evaluated alone. Three of the four interventions decreased target behaviour, the exception was self-management. The social acceptability scores for these interventions were high for both the teachers and students. The overall findings replicated Hoff et al.'s (2005) findings and showed that functional assessment of behaviour could be successfully used with students with Attention Deficit Hyperactivity Disorder in a mainstream classroom. They also showed that the teachers could successfully implement the interventions derived from the hypotheses to decrease target behaviours and that decreasing the difficulty of implementation of the interventions increased the acceptability of the interventions by the teachers.

## **Dedication**

This thesis is dedicated to my mum, Francie Brierly. Thanks for believing in me, and most importantly thank you for being you. I am who I am today because of it, love you lots

xx

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Assessments have been described as static vs. dynamic. Static assessment as described by Goldiamond, Dryud, and Miller (1965) classify behaviours by what they look like (Goldiamond et al., 1965). If one looks at just the form of the behaviour (i.e., statically) then as many problem behaviours look similar they might be treated similarly. Dynamic assessments mean classifying behaviours by their functions (Goldiamond et al., 1965). Thus as Goldiamond et al. (1965) suggest, behaviours of different forms will be in the same class "...if they are maintained in the same way" (p.113), and behaviours which look the same will be "...in different classes if they are maintained by different variables" (p.113). Over the last 40 years, technology for dynamic assessments has developed. Functional behavioural assessment is one such approach and it is becoming an accepted methodology. There is no precise definition of functional assessment, and the term is used in several ways. DuPaul and Ervin (1996) to functional assessment as, "the use of multiple assessment strategies in order to delineate specific antecedent and consequent events that set the occasion for and/or maintain a target behaviour" (p.604) and point out that this is similar to the usage of Horner (1994). This thesis uses the term similarly.

From being used with students with disabilities in special education classrooms in analogue settings, the functional assessment methodology is now being used effectively with students in mainstream educational classrooms (Crone & Horner, 2000; Larson & Maag, 1998). Boyajian, DuPaul, Handler, Eckert, and McGoey (2001) state that functional behavioural assessment has the ability to determine the function that a behaviour serves for an individual.

Crone and Horner (2000) state that "[t]he increased demand for [functional assessment] in schools results from at least two contextual factors: (a) existing approaches to problem behaviour in schools are no longer seen as adequate, and (b) there is a discrepancy between legislative mandates and the skills, resources, and training currently available in schools" (p.161).

Functional assessment consists of two phases, however functional assessment methods may not always include phase 2, an intervention can be based solely on the information obtained during phase 1. Phase 1 involves defining the behaviour operationally. Antecedents (any event or stimulus that occurs before a behaviour occurs) and consequences (events that occur after a behaviour and serve to strengthen and maintain behaviour) are observed directly by the observer (DuPaul & Ervin, 1996). In Phase 1 of a functional

assessment the ABC's (antecedents, behaviour, and consequences) are actually observed and recorded by the observer (Watson & Steege, 2003).

As DuPaul and Ervin (1996) point out, during Phase 1 (the descriptive analysis stage) hypotheses about the factors that maintain target behaviour are developed, and this allows for the development of individualised treatment plans. For example, say, Jimmy and Sam are in the same class and are displaying similar target behaviours. These behaviours include off-task behaviour, interrupting class mates, not working well in groups, and not attending to teacher instruction. Although the behaviours appear the same, the functions that these behaviours serve for Jimmy and Sam may be very different. A functional assessment may reveal that Jimmy's behaviours are maintained by attention, while Sam's behaviours are maintained by escape from task demands. Without a functional assessment the wrong intervention may have been implemented thereby reinforcing problem behaviours. Consider, for example, if both of the children's behaviours are hypothesised to be maintained by attention and the teacher decides to use time-out as the intervention, so that each time a target behaviour is exhibited the child is removed from the situation and the consequent attention. This intervention might be expected to work for Jimmy as he is being removed from the attention maintaining the target behaviour; however, Sam's behaviours may merely be negatively reinforced by allowing him to escape from difficult tasks and/or social situations.

The previous example shows how different behavioural functions require individualised intervention plans. Reid and Magg (1998) state that functional assessment "enables teachers to reach three goals: (a) analyse and modify environmental events to prevent inappropriate behaviour from occurring in the future; (b) determining the outcome, or function, an inappropriate behaviour serves so that it can be replaced with an appropriate behaviour that has a similar function; and (c) develop interventions to enable children with [problem behaviours] to exhibit socially desirable classroom behaviours" (p.2).

Phase 2 of a functional assessment includes the functional analysis of the behaviour, this involves testing the hypotheses developed in phase 1. Hypothesis testing leads to the design of interventions based on the conditions that maintain appropriate behaviour. Thus, as Kamps, Wendland and Culpepper (2006) point out, the two phases allow for interventions to be implemented based on the function of the behaviour. The following papers provide examples of the manipulation of environmental events involved in a functional analysis.

Iwata, Dorsey, Slifer, Bauman, and Richman (1994) looked at the occurrence of self-injurious behaviour and the effects that several maintaining variables had on the behaviour.

This study serves as an example of how functional analysis is conducted within an analogue setting. Participants were nine developmentally delayed children. Some participants engaged in a lot of self-injurious behaviour (SIB). All subjects engaged in two or more self-injuries topographies, with head banging the most prevalent behaviour. Sessions were conducted in a therapy room with a one-way mirror. Each session lasted 15 min, during which an observer recorded the occurrence or non-occurrence of SIB.

Participants were subjected to a series of experimental conditions to examine which affected the occurrences of SIB. Conditions were: social-disapproval, academic demand, unstructured play, and alone. All of the participants were exposed to four conditions using a multi-element design. During the social-disapproval condition attention was delivered each time the participant engaged in SIB, all other behaviours were ignored. During the academic demand condition the experimenter presented the child with a task demand regularly. Social praise was delivered upon completion of the request, occurrences of self-injury were met with termination of the task request, in which the experimenter would then turn away from the child for 30-s. During unstructured play the experimenter stayed within close proximity to the child, delivering social praise in response to any absence of SIB (every 30-s), all SIB was ignored. During the alone condition the child was placed in the therapy room alone, without access to toys or any other materials.

Results showed different patterns of responding across participants. All participants had a low level of SIB during the unstructured play condition. SIB behaviours were greatest during the alone condition, two participants exhibited high rates of SIB during the high demand situation, and one displayed high levels of SIB during the social disapproval condition. Two participants showed an undifferentiated pattern, in that they exhibited high amounts of SIB across two or more conditions.

These results provide evidence that SIB may be a function of different reinforcers, a finding that Iwata et al. (1994) note has “significant implications for treatment” (p.206). In other words, contingency changes that would change one person’s SIB might not alter another’s. Iwata et al. (1994) note that the use of analogue settings allows for identification and control of events related to SIB.

Kamps et al. (2006), also used analogue functional assessment procedures but within a general education setting. Procedures were “direct observations, teacher interview, hypothesis development, functional analysis, and intervention” (p.130). Observations were conducted in the classroom, each class comprised of 13-16 students. The observation process

included; “nomination by teachers as having a behavioural problem (using a list of objective criteria), use of a teacher rating scale with criteria for maladaptive and adaptive behaviour, and direct observation of on-task and social interaction behaviour” (p.130). Hypothesis development included a teacher interview. Teacher interviews were used in conjunction with the information gathered during direct observations to help develop specific hypotheses regarding the function of the student’s off-task behaviour(s). Using the descriptive information obtained during the direct observations and interviews, functional analysis conditions were implemented in the natural classroom setting with the teacher manipulating the various conditions. This information was then used to develop individual interventions.

Kamps et al. (2006) concluded that the procedures used here developed interventions that successfully decreased target behaviours. This study provides evidence that analogue functional assessment procedures are effective when applied in naturally occurring settings with students with a normal intellectual ability.

Students with a diagnosis of attention deficit hyperactivity disorder (ADHD) often present with problematic classroom behaviours, for example, out of seat, playing with objects, calling out, comments to peers, and aggression in school settings (Ervin et al., 2000). Functional assessments have been shown to be useful with students diagnosed as ADHD and examples of such studies will be presented later (Broussard & Northup, 1995; Ervin, DuPaul, Kern, & Friman, 1998; and Lewis & Sugai, 1996). Kronenberger and Meyer (2001) say that “children with ADHD frequently do poorly in school; they are more likely to have physical problems than other children; they have increased difficulties with peer acceptance; and they are more likely to be anxious and depressed” (p.42). DuPaul, Ervin, Hook, and, McGoey (1998) report that children diagnosed as ADHD have trouble staying on task during academic activities, thus limiting their potential for academic success. Ervin et al. (1998) point out that such children “have difficulty sustaining attention to tasks, completing assigned work, following instructions, and adhering to general classroom rules” (p.65). Thus, as DuPaul et al. (1998) say, it is no wonder that children diagnosed as ADHD are more likely to fail academically.

A diagnostic feature of ADHD as outlined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) “is a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individuals at a comparable level of development” (American Psychiatric Association, 2000, p. 85). ADHD is typically diagnosed before the age of seven. Inattention and/or

hyperactive/impulsive behaviours must be present in two settings before a child is diagnosed (American Psychiatric Association, 2000). ADHD is associated with problematic behaviours which in turn may produce problems for a child within structured settings. ADHD is typically seen in young males (Kronenberger & Meyer, 2001).

Ervin et al. (1998) report that ADHD has a high co-morbidity, thus as well as ADHD they may also receive other diagnoses such as oppositional defiant disorder (ODD, “a recurrent pattern of negativistic, defiant, disobedient, and hostile behaviour toward authority” (American Psychiatric Association, 2000, p. 100)), or conduct disorder (CD, “a repetitive and persistent pattern of behaviour in which the basic rights of others or major age-appropriate societal norms are violated” (American Psychiatric Association, 2000, p. 93)). Church (2005) points out that this co-morbidity questions the classificatory system of these disorders. He says that such classification “rests on the presence or absence of certain behaviours without reference to the functions with which those behaviours serve” (section 3, p.4). Thus, these ‘labels’ are seen as a result of the individual, rather than the interacting effects of the environment on the individual’s behaviour (Church, 2005). Here the target behaviour is similar, however the function maintaining the behaviour may differ. Church (2005) points out that an individual diagnosis does not help professionals determine the function a behaviour serves for an individual, thus making intervention selection and implementation problematic. This suggests that a functional behavioural assessment is more useful than a DSM diagnosis. Rather than labelling the child, functional assessment looks at ways to manipulate the child’s environment in order to decrease target behaviours.

Target behaviours, such as off-task behaviour, present difficulties for classroom teachers. Teachers are confronted with the daily task of trying to develop accommodations and interventions to meet the academic and social needs of children with behaviour problems. However due to limited resources and the lack of input from professionals many schools are unequipped to decrease target behaviours in the classroom (Boyajian et al., 2001).

It is possible that the functional assessment method could help teachers address such behaviour problems. Some functional analyses with children with ADHD have been conducted in analogue settings, that is, not in the child’s usual classroom. Lewis and Sugai (1996) state that “the systematic manipulation of behaviour in analogue settings is problematic in practical or applied terms...[because the] subject is being placed in a highly controlled and possibly unfamiliar setting” (p.3).

In an example of such a procedure Jones, Drew, and Weber (2000) used analogue functional analysis procedures to assess the target behaviours exhibited by a child with ADHD during a “clinic-based summer academic programme” (p.4). The functional analysis conditions included teacher attention (only disruptive behaviours were given attention), peer attention (access to peer attention while completing a simple task request), and escape (moved away from peers), these conditions were alternated using a multi-element design. Only the child and teacher were present in the session except for the peer attention condition where one peer was present. Direct observations of target behaviours (“talking out, playing with objects, or getting out of seat during an interval”)(p.4) during the 10 min sessions were observed through a one-way mirror using a 10-s partial-interval-recording procedure. Peer attention produced the most target behaviours (60%-100%). As a result of the functional analysis non-contingent reinforcement (NCR, here the context was the same as during the peer attention conditions) was tested using a brief-reversal design, and was found to be effective in reducing target behaviours. Jones et al. (2000) noted that their functional analysis was limited, as peer attention was only available during the peer attention condition. Thus, while the analogue functional analysis provided a valid hypothesis as to why the student’s behaviour was occurring in that setting, it is not clear to what degree the findings reflect what might have been happening in a usual classroom.

Broussard and Northup (1995) looked at the use of functional analysis within a classroom setting. Participants included Keith, 8, Mark, 6, and Jimmy, 6, all exhibited a variety of target behaviours. Jimmy had a diagnosis of ADHD.

Unlike Jones et al. (2000), this study was conducted in the participants’ usual education classrooms comprising 18-24 students. The assessment included teacher interviews, classroom observations, and the student’s academic records were revised. The investigator manipulated the conditions within the classrooms. All attention was withheld from the students while they participated in the normal classroom routine. Direct-observation data were collected using a 20-s partial-interval-observation procedure. Direct observations and conditions lasted 10 min. A single-case reversal design was used and included, contingent teacher attention (the student was kept on task by prompts from the investigator), contingent peer attention (provided attention), escape from academic tasks (tasks were presented that varied in difficulty), and contingency reversal. Dependent variables included task accuracy and work completion by the student during observation periods. Academic

completion and accuracy data allowed the researcher to see the relationship between behaviour and task completion.

Direct observations showed that Mark's work completion averaged 50%, and work accuracy averaged 13%. It was hypothesised that Mark's target behaviours were maintained by teacher attention. Behaviours increased during the contingent teacher attention condition (55%), than the non-contingent attention condition (2%). "Work completion averaged 92%, and work accuracy averaged 78%" (p.158). Contingency reversal conditions required the teacher to ignore target behaviours and provide attention for appropriate classroom behaviours. Contingency reversal conditions saw a decrease in target behaviours and an increase in work completion and accuracy.

Direct observations showed that Keith's work completion averaged 70%, and work accuracy averaged 48%. The functional analysis showed that target behaviours were only present in the presence of Keith's peers (87%). Suggesting that peer attention was maintaining Keith's problematic classroom behaviours. Contingency reversal conditions involved a class-wide differential reinforcement (DRO) procedure, here peers were reinforced for appropriate behaviours. No target behaviours were recorded during this condition.

Jimmy's results showed that behaviours increased when he was given a hard task (70%) versus an easy task (45%), thus Broussard and Northup's (1995) initial hypothesis was that "target behaviours were maintained by escape from difficult academic tasks" (p.160). The first phase of contingency reversal involved repeatedly prompting Jimmy to complete the assigned task. This was accomplished by staying close to him and maintaining eye contact. All target behaviours were ignored. DRO of on-task behaviour allowed 5 min of free-time (escape) in exchange for each completed task. While target behaviours decreased, work accuracy remained low suggesting that the task was too hard, thus tasks were modified. This resulted in no target behaviours and an increase in work completion and accuracy.

Broussard and Northup (1995) demonstrated that analogue functional assessment and analysis can be conducted in regular education classrooms including ADHD students. However, the classroom teacher had no role in the functional assessment and analysis process other than providing descriptive information in the form of interviews and questionnaires. Thus this study did not show whether it would have been possible for the teacher to implement a functional assessment and analysis within a mainstream educational classroom. This questions the use of analogue functional assessments for use within the classroom and

the ease of implementation for classroom teachers. Also, at one stage during the functional analysis process the participant was removed from their regular classroom, thus removing peer attention. It might be impractical for a teacher to remove a student from the classroom, and subsequent peer attention, every time that student displayed a target behaviour. These analogue procedures highlight a lack of practicality for use within the classroom by the classroom teacher.

Lewis and Sugai (1996) carried out a study on the use of functional assessment with normal-functioning, children in school settings using 3 participants. Study 1 comprised of Fred, a 7-year-old male who exhibited “high rates of off-task behaviour, and non-compliance with teacher directions” (p.6). ABC (antecedent, behaviour, consequence) observations indicated that peer and/or teacher social attention maintained target behaviour. Analogue functional analyses were conducted to assess Fred’s on- and off-task behaviour. A simultaneous treatment design was used to implement sessions across a 1-hr reading class. Condition 1 consisted of high peer attention plus low teacher attention (HPLT), Condition 2 consisted of low peer attention plus low teacher attention (LPLT). In the third condition, Fred received high peer attention plus high teacher attention (HPHT). This was achieved by placing Fred in a group of the high peer attention peers, and a fixed-interval 30-s schedule (FI30) was introduced to increase teacher attention. Results showed that Fred engaged in target behaviours to gain access attention, thus supporting the initial hypothesis.

Study 2 comprised of Jack, and Sal. Both were nine years old. Sal was identified as ADHD. Both engaged in off-task behaviours, observations suggested that Jack was off-task during independent activities, while Sal’s target behaviours allowed him to access teacher and peer attention. For Jack “a functional analysis was developed to assess the effects of independent versus small group task, peer attention, and teacher attention on Jacks’ behaviour (p.10). This was also done for Sal. Both participants behaviours were recorded using a partial-interval recording system. Data were collected across two 10 min sessions using a simultaneous treatment design. After 10 min the teacher changed groups.

Results of the functional analysis showed that Jack and Sal engaged in off-task behaviours to gain access to attention from peers and the classroom teacher. However, Lewis and Sugai (1996) did not implement any intervention. Thus, results from that study provide evidence showing it is possible to conduct a functional assessment within a mainstream classroom, but it is not clear whether it is possible to implement subsequent interventions.

While Lewis and Sugai (1996) showed functional assessment and analysis to be successfully used and implemented within a classroom, the analogue procedure used would be difficult for a teacher to replicate within a regular classroom. This questions the practicality of the procedure used in this study for use within a mainstream classroom setting.

In a review of functional assessment methodology up to the year of 2000 Hanley, Iwata, and McCord (2003) noted that only a small “percentage of studies included functional analyses of problem behaviours exhibited by children without disabilities” (p.53) (9%, total sample size was 277 studies). Hanley et al. (2003) noted that these results show that functional assessment with students of normal intellectual functioning is an area that warrants further research. Similar results were reported by Ervin et al. (2001) 100 articles that looked at the use of functional assessment strategies within school settings were reviewed. The articles included were published between January 1980 through to July 1999. Ervin et al. (2001) reported that only 12% of the studies were conducted within general education settings. It was also reported that analogue only settings (environmental variables were manipulated) numbered (43%) naturally occurring settings (usual routine, 36%). Ervin et al. (2001) also noted that very few studies included participants without disabilities (18%). This highlights the need for more research to be conducted in this area of functional assessment.

A search of the literature showed that many of the studies claiming to have conducted functional assessment within natural settings with ADHD children, actually used analogue conditions to test the functional relationships (e.g., Lewis & Sugai, 1996; and Wright-Gallo, Higbee, Reagon, & Davey, 2006). Some of these studies did not use the data gathered from the functional assessment to implement interventions to decrease the target behaviour (Lewis & Sugai, 1996). Few studies included classroom teachers in the implementation of the functional assessment, analysis, and/or subsequent intervention (e.g., Broussard & Northup, 1995 did not include the class teacher). As Hanley et al (2003) and Ervin et al. (2001) reported there is limited functional assessment research being conducted in naturally occurring classrooms, with students of normal intellectual functioning. Few studies assessed the use of functional assessment in real-life classrooms with children labelled as ADHD in a mainstream educational classroom with the teacher either implementing the functional assessment and/or subsequent intervention derived from the functional assessment process. The following three studies highlight the effectiveness of functional assessment within classrooms with ADHD children.

Ervin et al. (1998) looked at the usefulness of functional assessments with students with ADHD within the classroom. Participants were Carl and Joey, this study was conducted at Girl's and Boy's Town (a residential treatment facility), where a token economy was employed within the classroom, this involved the exchange of rewards contingent upon appropriate classroom behaviours. Behaviours exhibited by both boys were off-task behaviours and included; "talking, making funny noises, making faces, gestures, or writing notes" (p.68)

Joey's off-task behaviours were hypothesised to "be maintained by escape from paper and pencil writing tasks" (p.70). An intervention was developed for Joey that provided him with access to a computer to replace pencil and paper writing tasks. Hypothesis one was; "Joey's on-task behaviour will be increased when he is given the opportunity to complete long (20 min) writing tasks on the computer rather than by hand" (p. 70). Hypothesis was developed to increase on-task behaviour during journal writing. "Joey's on-task behaviour will be increased when he is able to brainstorm with a peer prior to a short (5-7 min) written task" (p.70). Hypothesis one and two were implemented during writing class in a one week period.

Carl's off-task behaviour was thought to be maintained by peer attention. Hypothesis one was; "Carl's on-task behaviour will increase when he is instructed to self-evaluate his peer attention-seeking behaviours and is awarded points for accuracy and low levels of problem behaviours" (p.71). Here Carl was asked to rate appropriate classroom behaviours. Hypothesis two was; "Carl's on-task behaviour will increase when he does not receive social reinforcers from his peers for his behaviour" (p.71).

A brief reversal design was used to manipulate hypothesised classroom variables by the classroom teacher. Here the normal classroom routine was alternated with the intervention conditions. Joey's on-task behaviour increased when he used a computer for writing tasks compared to pencil and paper tasks. On-task behaviours also increased when Joey used the peer brainstorming technique. A multiple baseline design was implemented throughout three of Carl's subjects. Carl's on-task behaviour increased when he self-evaluated. On-task behaviour was also higher when Carl's peers were reprimanded for attending to his inappropriate behaviour. The investigator and the teacher chose which components would be kept as an on going intervention within the classroom. The interventions that were implemented were observed to increase on-task behaviours within the classroom, thus providing support for the use of functional assessment within school settings.

Ervin et al. (1998) showed the effectiveness of functional assessment in classrooms, however, both were conducted in a classroom which had a token economy, thus was not representative of a mainstream classroom. A second limitation of this study was that the classroom comprised of only a small number of students (7-12), in contrast to an average classroom size of 25 to 30 students. This has implications for future research in that functional assessment, and consequent interventions may not be as successful in a general education classroom comprising more than 12 students. This study could also not determine whether there was an increase in academic productivity (increase in work completion and accuracy of work completed). One could however argue that increasing on-task behaviour would eventually lead to an increase in academic productivity and achievement.

In a further study Ervin et al. (2000) conducted functional assessment within the classroom with three students, Rick, Greg, and Timmy diagnosed as ADHD. Target behaviours were recorded using a partial-interval-recording system. Once descriptive data had been collected hypotheses regarding target behaviours were discussed between the researcher and the students teachers.

Three hypotheses were developed for Rick, along with various intervention approaches. Hypothesis one read; "Rick's inappropriate behaviour will improve when he is instructed to self-monitor with a reminder checklist of the classroom routine" (p.349). Here Rick was prompted to self-monitor on-task behaviour using a checklist that was placed on his desk; Rick's teacher reinforced successful self-monitoring. Hypothesis two read; "Rick's appropriate behaviour will improve when he is instructed to take notes during lecture time" (p. 349). Here Rick was required to write notes on the important aspects of the class. Hypothesis three read; "Rick's appropriate behaviours will be increased when his access to distracting materials is restricted" (p. 349). Here Rick was required to leave his bag at the teachers desk and sit away from any classroom distractions.

Two hypotheses were developed for Greg. Hypothesis one read; "Greg's appropriate behaviour will increase when he is instructed to self-evaluate his behaviour and is awarded points for accuracy and low levels of off-task behaviour" (p. 350). Here Greg was required to rate on-task behaviours, Greg's teacher also rated Greg's appropriate behaviour. Points were awarded to Greg if he and the classroom teacher produced similar rating results. Basketball cards were used as reinforcement. Hypothesis two read; "Greg's appropriate behaviour will increase if his teacher provided attention contingent on the absence of problem behaviour" (p. 350). Here Greg's teacher was prompted to provide attention every 5 min contingent on the

presence of on-task behaviour. Four hypotheses were developed for Timmy. Hypothesis one read; “Timmy will be more appropriately behaved when provided an alternative writing medium, rather than pencil and paper tasks” (p.350). Here a computer was provided for Timmy to complete tasks. Hypothesis two read; “Timmy will be more appropriately behaved when visual contact with peers is reduced” (p.350). Here Timmy was removed from class peers. Hypothesis three read; “Timmy will be appropriately behaved when provided applied tasks rather than analogue” (p.351). Here applied tasks were compared to analogue tasks. Hypothesis four read; “Timmy will be more appropriately behaved when in close teacher proximity” (p.351). Here the teacher was seated in either close or distant proximity to Timmy. Attention was contingent upon appropriate requests.

Each hypothesis was tested using an alternating treatments design; “here baseline conditions (i.e., the typical conditions in the classroom associated with high levels of problem behaviour) were alternated with conditions in which potential intervention strategies were implemented (i.e., the condition hypothesised to produce low levels of behaviour” (Ervin et al., 2000, p.351). Rick’s on-task behaviour increased during the first self monitoring session, this was not witnessed for the rest of the assessment. The percentage of intervals on-task throughout note taking was higher (97.8%) than when Rick took no notes (54.4%). Rick’s on-task behaviour was observed to be higher (91.7%) when materials that could be distracting were accessible, compared to when access was restricted (69.3%). During hypothesis testing Greg’s on-task behaviour was higher when the self evaluation was in place (94.7%) than when it was not (69.3%). Greg’s on-task behaviours were also seen to increase when teacher attention was provided contingent upon on-task behaviours. Timmy’s on-task behaviour improved (93%) when he had access to a computer to complete assignments, compared to when he was writing by hand (32%). On-task behaviour also increased when visual contact with peers was prohibited, when Timmy was set applied tasks (96%) rather than analogue (42%), and when a teacher was in close proximity.

Ervin et al. (2000) showed that functional assessment procedures were successful in decreasing off-task behaviours “with students of average or above average intellectual functioning and communication skills” (p.356). Ervin et al. (2000) also showed that it was possible to conduct a functional assessment and subsequent intervention within the classroom with the classroom teacher conducting the observations and implementing the interventions. Evaluated hypotheses were only conducted over one to three sessions; however no data on intervention maintenance was collected.

In the most recent of these studies Hoff, Ervin, and Friman (2005) evaluated the effectiveness of a functional assessment procedure by looking at the effects of environmental factors on the occurrence and non-occurrence of target behaviour in a regular classroom setting. The functional assessment was implemented by the classroom teacher. The participant, Kevin, was a 12-year-old boy with increased rates of target behaviour. Kevin was diagnosed with ADHD and ODD. Kevin's target behaviours were "defined as the occurrence of inappropriate verbal behaviour, making faces, talking out, touching peers' materials, taking peers' materials, throwing things into the air, and getting out of his seat" (p.48). The study was conducted in a classroom located within a residential facility. The classroom comprised of 14 students and one teacher. The classroom employed the Boy's Town Psycho-educational Model, which involved a token economy, here students could exchange points for rewards. A social skills training program was also in place, both were maintained throughout the study.

First Hoff et al. (2005) conducted interviews, direct observation, and questionnaires to determine environments that may increase target behaviours. Next, information was gathered in regards to the non-occurrence of problem behaviours. Alternating treatments design across a multiple baseline was used to evaluate the interventions. Treatment was followed by a return to baseline. The intervention that produced the greatest reduction in off-task behaviour was implemented. Lastly, interventions were introduced into the normal classroom routine.

The class was a 45 min lesson on religion, direct observations were undertaken only when the teacher was not attending the class. Direct-observation data determined the occurrence and non-occurrence of target behaviour. A partial interval recording system with 15-s intervals was used to collect data. Data collection was conducted over a six week period, 3-4 days per week throughout the 45 min class. Direct observation data were collected 3-4 days per week for 6 weeks. Observations were conducted for the entire 45 min class period; however, the analysis focused only on times when the teacher's attention was diverted as these were the times when Kevin's target behaviours were more likely to occur. Inter-observer agreement data were collected for 23% of the total sessions observed. The mean percentage of inter-observer agreement was 94.03%.

Functional assessment interviews were based on O'Neill et al's. (1997) Functional Analysis Interview. Some of the questions were reworded for use within a normal classroom. The teacher then completed the Problem Behaviour Questionnaire as used by Lewis, Scott, and Sugai (1994). Both the interview and the questionnaire looked at situations that were

most likely to produce target behaviours. Hoff et al. (2005) adopted Shapiro's (2004) behaviour observation code, and O'Neill et al's. (1997) Functional Assessment Observation Form.

The teacher and the researcher met during hypothesis development to review the descriptive data. Data indicated that when the teacher was not attending the class Kevin's level of target behaviours increased. This information suggested two likely functions of Kevin's target behaviour, access to peer attention, and escape from non-preferred activities. Direct observation data pointed to peer attention as a function, however, direct observations of the class did not match the teacher's hypothesis, that Kevin engaged in off-task behaviour to gain access to teacher attention.

Three hypotheses were developed in regard to Kevin's target behaviours. Hypothesis one was that Kevin was disruptive because it resulted in access to peer attention. Hypothesis two was that Kevin engaged in target behaviour because it resulted in avoidance/escape of a non-preferred task. Hypothesis three looked at several functions of Kevin's target behaviour, specifically, "when Kevin is presented with less-preferred reading material and when Kevin's preferred peers are in close proximity, Kevin engages in disruptive behaviour to avoid/escape non-preferred reading work and access/gain peer attention" (Hoff et al., 2005, p. 50).

Each hypothesis led to the development of a specific intervention. Kevin's teacher evaluated the effectiveness of each intervention strategy during his religion class. Each intervention was implemented by the classroom teacher, data on target behaviours were collected by the researcher.

The following conditions were implemented in intervention: Baseline, Preferred Peer Close Versus Far, and a Combination of Preferred Peers Far, and More Preferred Reading Materials. Baseline conditions required Kevin's teacher to conduct and arrange classroom activities according to typical classroom procedures. Preferred Peer Close Versus Far involved moving Kevin's seating arrangement, so he was seated away from high preference peers. In addition students were asked to ignore all inappropriate behaviours while the teacher was not attending the class, otherwise the class remained the same. More-versus less-preferred reading materials looked at the effects of high preference books on Kevin's behaviour while the teacher had his back turned. More preferred religious reading materials (religious books containing stories and pictures) were placed under Kevin's desk by his teacher on days that this hypothesis was tested. The Combination of Preferred Peers Far and More-Preferred Reading Materials allowed both the teacher and the researcher to see whether

the combination of the two interventions would decrease target behaviour. The combination of the two interventions required Kevin's teacher to alter the seating arrangement and provide more preferred reading materials.

After the final intervention phase had been implemented consumer satisfaction questionnaires were given to both the teacher and the student to complete. They were both required to assess how acceptable, effective, and feasible the functional assessment and subsequent intervention were. The Intervention Rating Profile-20 as used by Witt & Martens (1983) consisted of 20 items that were rated on a Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree) was administered to the class teacher. Questions assessed the use and the acceptability of the functional assessment and the subsequent interventions.

The children's Intervention Rating Profile as used by Witt & Elliott (1985) is a 7-item questionnaire using a 6-point Likert scale. A score of 1 suggested that Kevin did not agree, while a rating of 6 suggested that he agreed. Results of the consumer rating profiles showed that treatment acceptability ratings by the classroom teacher were high, with an acceptability score of 110/120. Kevin rated the intervention highly, with a score of 39/42.

Hoff et al. (2005) note some limitations; the role of the school wide interventions were not evaluated, the participant took medication for disruptive classroom behaviours, and the class consisted of only 14 students. Having fewer students in the classroom may have made the functional assessment and subsequent intervention easier to conduct, thus could have produced high acceptability scores for the classroom teacher. Hoff et al. (2005) note that while many professionals are aware that behaviours have the ability to serve several functions, few school-based functional behavioural assessment studies have addressed this issue. Hoff et al. (2005) could have concluded that each intervention was successful in decreasing target behaviour, and subsequently have stopped further intervention from being implemented, instead the two interventions were combined, thus resulting in a further decrease of the target behaviour. The alternating treatments design across a multiple-baseline allowed Hoff et al. (2005) to view the changes in target behaviour when the intervention was implemented, compared to no intervention (usual classroom routine). Hoff et al. (2005) demonstrated that when interventions were combined, Kevin's target behaviour dropped dramatically. Results indicated the intervention was successful in decreasing Kevin's target behaviour. High acceptability ratings were given by both the teacher and the student, suggesting that the intervention used were socially acceptable. Hoff et al. (2005) note that the classroom token economy may have contributed to effectiveness of the interventions. Also

classroom size was considerably smaller than would be found in a typical general education classroom, and Kevin's target behaviour did not occur across multiple settings.

As noted earlier, functional assessment research that is implemented in real-life classrooms with children labelled as ADHD in a regular educational classroom with the teacher either implementing the functional assessment and/or subsequent intervention is limited, thus highlighting the importance for further research to be conducted in this area (Ervin et al., 1998; Ervin et al., 2000; and Hoff et al., 2005).

Although Iwata et al. (1994) and Kamps et al. (2006) showed it was possible to use analogue settings to simulate naturally-occurring situations with children, however, analogue assessment may not always be a desirable procedure. As noted earlier analogue functional assessment is limited to a contrived environment, and condition manipulations would be impractical for a teacher to implement while teaching a class. Also, other studies have focused on classes with a limited number of students, for example Hoff et al. (2005) conducted a functional assessment, analysis and intervention in a class comprising 14 students. Ervin et al. (2000) conducted functional assessment procedures in a classroom comprising only 6 students. These studies question the use of functional assessment with larger class sizes. Can functional assessment be successfully implemented in a class that comprises more than 15 students?

## Experiment 1

The current study aimed to extend the research conducted in educational settings using functional assessment (i.e., Ervin et al., 1998; Hoff et al., 2005) to examine the function of target classroom behaviours exhibited by students with ADHD, and to use this to design a teacher-implemented intervention. The current research looked at whether it was feasible to implement a functional assessment, analysis, and subsequent intervention in a class comprising of at least 25 students, with the teacher implementing the interventions derived from the functional assessment. New Zealand class sizes are generally between 25 and 30 in public schools.

Not only did the present study replicate some of the procedures used by Hoff et al. (2005) but the researcher also selected Hoff et al.'s (2005) research design. The multiple-baseline design across alternating conditions allowed the comparison of initial baseline data to data collected during intervention implementation. This design also allowed the intervention and baseline conditions to be alternated, this alternation between the separate conditions allowed comparison of the effect of each intervention and its effect on target behaviours during the usual classroom routine. The Hoff et al. (2005) study was chosen for this replication as it examined functional assessment with ADHD children in their usual classrooms and included the classroom teacher in the process. The functional assessment process used by Hoff et al. (2005) was also used in the present study. As in Hoff et al. (2005) interviews, questionnaires, and direct observations were reviewed by both teacher and the researcher. From these discussions tentative hypotheses could be formed regarding the function of the student's off-task behaviour. These tentative hypotheses were then translated into intervention strategies that could be implemented easily by the teacher. As in Hoff et al. (2005) the strategies were combined to examine the additional effect this may have had on target behaviours. Hoff et al. (2005) proposed that the use of two interventions resulted in a further decrease in target behaviours.

The present study, then, focused on whether it was feasible to conduct and implement a functional assessment in a general education setting within a regular New Zealand classroom with the teacher implementing the interventions. Social validation questionnaires were used to determine the acceptability of the functional assessment and the subsequent interventions with all those involved in the process.

## **Method**

### ***Ethical Approval***

The University of Waikato requires that the Department of Psychology Research and Ethics Committee reviews and approves research that involves human participants. As this study involves human participants a research proposal (see Appendix 1) detailing the study procedures was submitted to the ethics committee along with cover letters (see Appendix 2) and information sheets (see Appendix 3) that would be given to school personnel. The proposal also included parent information sheets (see Appendix 4) and consent forms (see Appendix 5). We were able to proceed with the study once ethical approval was gained.

### ***Setting***

The study was conducted in two general-education classrooms within a primary school located in a North Island city in New Zealand. The entire school employed a consequences system, here the teacher would write a student's name on the board when they displayed certain disruptive behaviours. If the student was disruptive again during the day they would gain a cross next to their name. This would result in the student staying in after class and writing a letter apologising to the teacher for their disruptive behaviour. If a second cross was added to their name, the principal and their parents were notified.

The entire school also employed a system where students could gain "virtue vouchers" for good behaviour. Virtue vouchers were given to students by their class teachers. These virtue vouchers were placed by the students in a container in the office. During assembly a name would be drawn out of a hat and that person would receive a prize of some sort. Both of these systems were in place in both classrooms throughout the study.

### ***Selection and Participants***

Information about the selection criteria was given to the vice-principal who then sent a memo to the classroom teachers who were known to have children who engaged in disruptive behaviours in their classrooms. Students were required to have either a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD), or have met the criteria for ADHD according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR, 2000. See Appendix 6). The teachers were provided with information sheets (see Appendix 3) and a copy of the research proposal (see Appendix 1). They were also provided with the information that would be sent home with the students requesting consent from parents (see

Appendix 4). With this information the teachers were able to make an informed decision as to whether they would participate.

While the study required 2 participants, the school was asked to identify several possible participants, in case parental consent for one child to participate was not received. Potential participants were required to have parental consent before the study was able to proceed further. Consent involved sending an information sheet (see Appendix 4) home to the parents of the child explaining in detail the expectations of the research. Parents were asked to sign the consent form (see Appendix 5) and return it to the school for the researcher before their child was included in the study.

The participants in this study were Brad and Joel. Joel was a 9-year-old boy who was diagnosed with ADHD and thus met criteria for study inclusion. Joel displayed disruptive behaviour (calling out, interrupting, playing with materials, and crying) in the classroom. Joel was not receiving any medication for his ADHD.

Brad was a 9-year-old boy who exhibited high rates of disruptive behaviour (for example calling out, interrupting, playing with materials, and gestured smoking and shooting behaviours) in the classroom. Brad did not have a diagnosis of (ADHD), but instead meet ADHD criteria to be included in the study according to the DSM-IV-TR. Brad was not receiving any medication.

Joel's classroom consisted of 31 students, and one teacher. In addition to the school behaviour management Joel's teacher had implemented a class-wide points system where seating groups could earn points for good behaviour, these were allocated throughout the school day by the class teacher. At the end of each week the group with the most points would receive a prize. This system was in place in Joel's classroom throughout the entire study. Brad's classroom consisted of 29 students and one teacher.

### ***Materials***

The descriptive assessment included the Functional Analysis Interview Form (Packer, 2001-2006), the Student Assisted Functional Assessment Interview (Kern, Dunlap, Clarke, and Childs, 1994), the Problem Behaviour Questionnaire Form (Lewis et al., 1994), the Disruptive Behaviour Disorders Rating Scale- Teacher Form (Barkley, 1997), and ABC observation forms. Data were collected using the Behaviour Observation program (BOB) and a palm pilot. The palm record (see Appendix 13) was used to record variables that may affect target behaviours. Social acceptability was assessed using the Intervention Rating Profile

(IRP-15, Witt & Elliott, 1985), and the Student Intervention Rating Profile (Witt & Elliott, 1985).

## **Procedure**

A short outline of the procedure is given here followed by details of each phase. Once consent was gained, teacher interviews and some of the questionnaires were filled out to develop operational definitions of the target behaviour for each student. The researcher then observed each student directly and recorded the ABC's of the behaviour. During this phase the operational definitions were finalised. Then the researcher and the teacher discussed tentative hypotheses about behavioural function. Student interviews were conducted with each student. Once hypotheses were formulated the teacher and the researcher discussed possible interventions. This was followed by baseline data collection. Once the baseline data were stable the selected interventions were implemented using a multiple-baseline design with alternating treatments. The first interventions were implemented successively for each student and these were alternated with no intervention sessions, then the second intervention was introduced. The second intervention sessions also alternated with both first intervention sessions, and the sessions with no intervention. The combined interventions were introduced with no alternating conditions. A return to baseline was introduced after the combined interventions sessions, and then the combined interventions were reintroduced. Upon completion of the study, both the teachers and the students completed social acceptability questionnaires.

### ***Teacher Interviews***

Each functional assessment interview was administered to each teacher separately in an empty classroom (see Appendix 7). The teacher interviews questions were derived the Functional Analysis Interview Form (Packer, 2001-2006) which focused on the target behaviours occurrence and non-occurrence. Questions included; "What is happening when the behaviour occurs?" and "What is the likely function of the behaviour?" Upon completion of the interview the classroom teacher was asked to complete the Problem Behaviour Questionnaire (see Appendix 8) (PBQ; Lewis et al., 1994), and the Disruptive Behaviour Disorders Rating Scale-Teacher Form (see Appendix 9). The PBQ consisted of 15 questions, teachers were asked to circle the frequency ("never to always") with which an event was likely to be observed relative to the problem behaviour (Lewis et al., 1994). The Disruptive

Behavior Disorders Rating Scale- Teacher Form is rated from 0-3, 0 being never, and 3 being often, and asks questions that address a student's impulsivity, attention, and hyperactivity. The information provided during the teacher interviews were used to assess the times in which target behaviours were most prevalent for observation and data collection. From the teacher interviews tentative operational definitions of the students target behaviours were developed in order to record the target behaviour throughout the ABC observations.

### ***ABC Analysis***

After the teacher interviews initial direct observations were conducted by the researcher to view the students in their classrooms to observe the occurrence and non-occurrence of target behaviours, and the antecedents (what happened before the target behaviour occurred) and consequences (the consequence/s that resulted from the behaviour) surrounding that behaviour. ABC's were recorded on a behavioural observation form (see Appendix 10). Direct observation data for Brad's target behaviours were collected over 4 days, during 2 sessions. Direct observation data for Joel's disruptive behaviours were collected over 10 days and during 5 sessions. After direct observation the operational definitions were finalised.

### ***Final Operational Definitions***

The target behaviours observed during functional assessment were operationally defined into two categories; off-task motor and off-task verbal. Off-task motor behaviours were defined as any instance of motor activity that was not directly associated with an assigned task, while off-task verbal behaviours were defined as any verbalisations that were not permitted and/or were not related to an assigned academic task. Specific definitions were then developed for each child. The defined behaviours were then classified as either an event or a state for data recording purposes. Events were behaviours or actions of a relatively short duration, such as waving, or standing up. States were behaviours or actions of relatively long duration, such as sitting.

***Joel.*** Joel's off-task motor behaviours were defined as the occurrence of: physically touching another student when not related to an academic task, banging materials and/or furniture causing a loud disruptive noise, and engaging in play with inappropriate materials.

Joel's off-task verbal behaviours were defined as the occurrence of: making any audible sound (such as whistling, humming, forced burping, laughing to self, singing to self and/or weird noises), talking to another student when talking is prohibited by the teacher, making unauthorised comments or remarks, calling out answers to academic problems when

the teacher has not specifically asked for an answer, or permitted such behaviour, interrupting other students when they are speaking in a group situation, interrupting other students conversations, complaining when a task is delivered, using an inappropriate volume for the task at hand, and crying when a task is delivered (see Appendix 11 for operational definitions).

**Brad.** Brad's off-task motor behaviours were defined as the occurrence of: physically touching another student when not related to an academic task, sharpening pencils, pretending to smoke, pretending to shoot peers, banging class materials and/or furniture causing loud disruptive noises, and engaging in play with inappropriate materials.

Brad's off-task verbal behaviours were defined as the occurrence of: making any audible sound (such as whistling, humming, forced burping, laughing to self, singing to self and/or weird noises), talking to another student when talking is prohibited by the teacher, making unauthorised comments or remarks, calling out answers to academic problems when the teacher has not specifically asked for an answer, or permitted such behaviour, interrupting other students when they are speaking in a group situation, interrupting other students conversations, complaining when a task is delivered, and using an inappropriate volume for the task at hand.

### ***Student Interviews***

The student interviews were based on the Student-Assisted Functional-Assessment Interview (Kern et al., 1994) and consisted of two sections. Student interviews (see Appendix 14) were conducted to gain an idea of the students perceived work load within the classroom, and were used to identify potential rewards that would function as reinforcers during the intervention process. Section 1 required the student to answer either "always", "sometimes", or "never" to the questions. This section looked at whether the student's work was too hard/easy, whether they were distracted in the classroom and whether their performance would improve if they received more rewards. Section 1 questions included; "Do you like working with other people?", and "Are there things in the classroom that distract you?" Section 2 looked at whether the students could report the appropriate behaviours needed to gain appropriate teacher attention, and to find out what may function as a successful reinforcer. Questions included; "What do you do when you need help from the teacher?", "Which ways are not so good at getting the teachers attention?", and "What kind of rewards would you like to earn for good behaviour or good school work?"

### ***Hypothesis Development***

Hypotheses were formed from the information gathered from teacher interviews, questionnaires, and the ABC analysis, a meeting was held with each teacher separately to discuss the tentative hypotheses.

***Joel.*** Information gathered from the interviews, questionnaires, and direct observations pointed to one function maintaining Joel's target behaviour: access to teacher attention. Teacher interviews revealed that Joel was particularly disruptive during group work, or while the teacher was attending to other students. Such behaviours that occurred at a high frequency were, interruptions, and calling out. Therefore Joel was observed during group reading, as this was the time that he was most disruptive.

Direct observations of Joel's target behaviour within the classroom showed that Joel's target behaviours were typically ignored by the classroom teacher, and his peers. Joel's peers were witnessed to rarely provide Joel with positive reinforcement; his behaviour seemed to isolate him away from his peers. Direct observations also revealed that Joel would interrupt situations where the teacher's attention was diverted from him, for example working in a group situation. Joel was witnessed by the researcher during direct observations to interrupt the teacher when she was busy, when Joel's behaviour was ignored he would continue to interrupt until he received a response. These observations suggested that Joel lacked the skills needed to evaluate whether it was appropriate to approach the classroom teacher. In group situations Joel would often interrupt other students, and/or the teacher while they were talking, blurt out the answer to questions that were not directed to him, and make inappropriate noises, or repeat a certain word. These target behaviours were of concern to his classroom teacher.

***Brad.*** Information gathered from the interviews, questionnaires, and direct observations pointed to two possible functions of Brad's target behaviour. These were access to peer attention and access to negative teacher attention. The teacher interview revealed that Brad would deliberately make comments to gain peer attention. These peers were a certain group of boys within the classroom; however target behaviour also occurred away from this particular group. Brad's teacher also said that Brad would be constantly out of his seat sharpening his pencil, and that Brad would deface the covers of his books. Brad's teacher also reported long and disruptive transitions between tasks, and reported Brad was always unorganised.

Direct observations of Brad's behaviour within the classroom showed that Brad's off-task behaviours were often redirected, however the few times that Brad was on-task he received no positive attention from the class teacher. Target behaviours such as talking were reinforced by his peers by them talking back to him or laughing at his comments. Direct observation revealed that Brad seemed to enjoy being told off, like it was a game between him and his peers to see who could get their name on the board the fastest. In one particular observation Brad was witnessed saying "yes" when his name was put on the board. This provided further support for the hypotheses.

Given the information obtained both the researcher and the teachers agreed that both hypotheses were plausible.

### ***Intervention Hypotheses***

***Joel.*** It was hypothesised that Joel's target behaviours were maintained by one function; teacher attention. The specific hypothesis read; "When the teacher's attention is diverted from Joel, he engages in disruptive behaviour to access teacher attention".

***Brad.*** Two hypotheses were developed. Hypothesis one was that Brad engaged in target behaviours to gain access to peer attention, or more specifically; "When Brad is in close proximity to his preferred peers, Brad engages in target behaviour to gain access to peer attention." The second hypothesis was that Brad engages in target behaviour to gain access to negative teacher attention. The specific hypothesis was; "When Brad is disruptive in class he gains access to negative teacher attention."

### ***Baseline and Interventions***

A multiple-subject design across subjects was used as the treatment design as subjects required ongoing monitoring of behaviour. During hypothesis development baseline data were collected. Selection of session times were based on information collected during teacher interviews, sessions lasted 40 min. Direct observations conducted by the researcher determined the occurrence of target behaviours during baseline. Data were collected using a palm pilot, the palm recorded every occurrence of target behaviour (see Appendix 12), thus, data were recorded using frequency recording.

Observers were the primary researcher and a trained graduate student, who collected inter-observer agreement data. Agreements were recorded when both the observer and the researcher recorded an occurrence of behaviour as defined in the operational definitions. Each occurrence of behaviour recorded by both the observer and the researcher had to be within 5-s of each other to be counted as an agreement. Inter-observer agreement was

calculated by dividing the number of agreements between observers by the total of number of agreements and disagreements, and then multiplying them by 100. Inter-observer reliability was conducted throughout the study. Inter-observer agreement were collected for at least 25% of the total sessions observed for both participants.

The palm pilot used the Behaviour Observation program (BOB) developed by the psychology technicians at the University of Waikato. Behaviours were separated into events or states. Events were behaviours or actions of a relatively short duration and were recorded using frequency recording. Events included all the verbal behaviours and motor behaviours such as, inappropriate physical touching, and banging. One touch of the appropriate part of the screen recorded the event and the time it occurred. States were behaviours or actions of relatively long duration and were recorded using duration recording, for example; playing with objects unrelated to task. Thus the appropriate part of the screen had to be touched to indicate the behaviour had started, and again to indicate the end of the behaviour. The palm allowed recording of the start and end times when the appropriate part of the screen was touched. When a state was “on” that part of the screen darkened until it was touched again, this indicated “off”. Each behaviour code was entered into the palm for each participant; the data for each participant could then be recorded separately. The data were entered into the palm using a stylus. The palm recorded the participant’s name, the time the behaviour happened, and the behaviour (see Appendix 12). Each session was 40 min in length. At the start of an inter-observer agreement session the palms used by both observers were started simultaneously to allow calculation of agreement.

In order to record events that may have affected target behaviours an extra record of the data was kept by the researcher (referred to here as the palm record, see Appendix 13). The palm record recorded the observer(s), the date and the day of the week, the setting and/or class activity, the time period for each activity, and there was a space to record whether the wrong button had been pushed on the palm. In the event that the wrong button was pushed these behaviours were subtracted from the final data. The data were then downloaded from the technician’s computer, data were plotted onto graphs for analysis.

During baseline conditions the usual classroom routines were kept constant by the classroom teachers. Baseline data needed to be stable before intervention could be implemented. Baseline was considered stable when no baseline data point varied more than 50% from the mean.

Once baseline was stable the interventions were introduced using a multiple baseline across subjects design with alternating conditions. Two different intervention strategies were implemented for each student which alternated with baseline conditions (no intervention). When stable responding had been attained for the first subject, an intervention was applied for the second subject (Cooper, Heron, & Heward, 1987). The final intervention involved combining the two interventions, thus stopping alternation of the interventions. Here a return to baseline was introduced before reintroducing the combined interventions.

Each hypothesis derived from the functional assessment was developed into an intervention strategy. Interventions were discussed separately with each teacher.

***Joel Intervention 1.*** From the hypothesis developed during the functional assessment process and in discussion with Joel's teacher a simple peer support system and token economy were proposed to reduce target behaviours associated with the hypothesis; Joel was disruptive because it results in teacher attention.

The idea behind peer support was that rather than asking his teacher for help straight away Joel was to ask one of his peers. Hoffman and DuPaul (2000) note that peer tutoring has been found to be successful in increasing on-task behaviours with ADHD students. "Peer tutoring is defined as an instructional strategy that involves two students working together on an academic activity, with one student providing assistance, instruction, or feedback to the other" (Hoffman & DuPaul, 2000, p.654). It was hypothesised that peer tutoring would reduce Joel's target behaviours associated with gaining access to teacher attention. A few simple guidelines were set up for the teacher to follow. First thing in the morning Joel's peers would volunteer to be his designated peer for the day. The classroom teacher suggested that rather than having someone chosen for him, that Joel could choose his peer support student for the day to ensure that he felt comfortable approaching the chosen peer. The peer acted as a first point of contact for Joel. The peer's job was to answer any questions Joel may have, rather than having him interrupt the class teacher. This approach worked well as Joel always knew who his peer for the day was, as he selected them himself. The peer support intervention was implemented throughout the entire school day and instances of good peer supporting, and the use of the peer were praised.

***Joel Intervention 2.*** The token economy employed a response-cost system, DuPaul and Weyandt (2006) report that "[t]oken reinforcement is a commonly used strategy. In which students earn immediate reinforcers (e.g., stickers, points) for meeting behavioural expectations and the points can be exchanged later in the day or week for back-up reinforcers

(e.g., preferred home and school activities)” (p.164). Token economies may include a response cost. Rapport, Murphy and Bailey (1982) used response cost effectively with ADHD children, here the student was firstly a maximum number of points or tokens the student was then required to remain on-task to keep the reinforcers. Joel could earn tokens for appropriate behaviour; however, he could also lose tokens for inappropriate target behaviours. This particular intervention was used with Joel, as consequences received for inappropriate behaviour seemed to impact his behaviour. The number of tokens received was determined by direct observations and baseline data. Joel was observed to work quietly on more than one occasion, however waiting quietly and raising his hand were observed less frequently, and therefore these behaviours were allocated higher reinforcement. Fines were kept to a maximum of one token, this made it easier for the teacher to implement rather than having to remember which behaviour corresponds to which fine. Also, if fines were too high it would make reinforcement less accessible to Joel and we wanted reinforcement to be high at the start of the intervention to encourage appropriate behaviours.

Potential reinforcers were identified during the student interview, these were; a chocolate bar, stickers, computer time, and free-time. Joel received a token when he: (1) raised his hand appropriately (2 tokens), (2) waited quietly for assistance (3 tokens), and (3) Worked quietly (1 token). Joel was fined for: (1) Calling out (1 token), (2) interrupting (1 token), (3) inappropriate physical touching (hitting) (1 token), and (4) playing with inappropriate materials (1 token).

When an infraction took place, Joel’s teacher was required to immediately remove a token. The withdrawal was required to be accompanied with a brief non-judgemental description of the target behaviour. This was to help Joel identify which behaviours were inappropriate and incompatible with appropriate behaviour.

***Brad Intervention 1.*** The first intervention with Brad was to address the functional hypothesis of peer attention on Brad’s target behaviour and involved a simple seating change. Ervin et al. (2000) showed that when visual contact with peers was limited, by managing the seating arrangement, the percentage of intervals on-task were higher (98%), than when the student was in close proximity to peers (26%). Intervention 1 involved Brad’s teacher seating him away from his preferred peers. During this intervention Brad was seated at a desk alone that was in close proximity to the teacher. If the hypotheses developed during functional assessment were correct, his target behaviour should decrease when moved away from his preferred peers.

**Brad Intervention 2.** The intervention strategy implemented to decrease target behaviour maintained by negative teacher attention was a token economy. The token economy involved determining specific individualised reinforcers. These were identified by the student during the student interview process. Brad's reinforcers were; Fruit Bursts, chocolate bars, free-time, and a small toy car. Free time was not a tangible item and could only be used at certain times at the teacher's discretion. To remedy this problem the student was given a card that read "free-time", this card could then be used at an appropriate time.

Once the potential reinforcers were selected the researcher met with Brad's teacher to discuss the token economy. Certain guidelines were established to help the teacher implement the intervention appropriately. The token economy rules were: (1) Clearly outline reinforcers to be earned for the day, and their "cost". (2) Keep a personal record of tokens earned. (3) The token economy will only be implemented for part of the day, either 11.00-12.30 or 1.30-3.00. (4) Tokens are exchanged for reinforcers at the end of each day. (5) Token hoarding is not allowed. (6) Tokens cannot be taken away once they have been earned. (7) Tokens are delivered alongside praise. (8) Free time will be allocated to the student at an appropriate time. A free time card will be handed to the student, which the teacher will implement where they see fit.

The number of tokens received for each appropriate behaviour was determined by direct observations and baseline data obtained by the researcher. Observations by the researcher showed that Brad was able to appropriately raise his hand and wait for assistance; however working quietly and making fast transitions were rarely witnessed, so these behaviours were allocated a higher rate of reinforcement. Brad received a token when he: (1) raised his hand appropriately (1 token), (2) for working quietly (2 tokens), (3) for fast transitions (3 tokens) and (4) for waiting appropriately for teacher assistance (1 token).

It was hypothesised that Brad's target behaviour would be replaced by the above appropriate behaviours through the use of exchangeable tokens, paired with praise.

### ***Treatment Acceptability***

Teacher's (see Appendix 16) and student's (see Appendix 15) were given consumer satisfaction questionnaires at the conclusion of the study to assess how acceptable, effective, and feasible the functional assessment process and the subsequent interventions were. Unlike Hoff et al. (2005), who required only one questionnaire to be completed by the teacher and the student to rate both class interventions, the class teacher and the student were asked to complete a consumer satisfaction questionnaire for each intervention. This allowed the researcher to see which intervention was preferred. The class teacher completed the Intervention Rating Profile (IRP-15; Witt & Elliott, 1985). This questionnaire consisted of 15 items rated on a Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree). The IRP-15 only looks at the selection of the intervention, thus, the items were reworded to rate the acceptability of the functional assessment as well as the interventions. Participants were asked to complete the Children's Intervention Rating Profile (Witt & Elliott, 1985). The Children's Intervention rating scale is a 7-point Likert scale. A rating of 1 meant that the participants did not agree, while a rating of 6 meant that participants agreed with the question.

## **Results**

### ***Teacher Interviews***

***Joel.*** Joel's teacher reported four specific target behaviours during the teacher interview that she found particularly disruptive to her classroom routine. These included; touching other students inappropriately, interrupting classmates and/or the class teacher, complaining, and crying. Each of the behaviours were described to the researcher.

Joel's inappropriate touching was described as poking and/or lightly hitting other students within close proximity to him. Joel's teacher reported that he seemed to enjoy annoying other people. These physical behaviours were most likely to occur during a group situation, or while seated on the mat. Joel's inappropriate touching of other students was rarely witnessed by the teacher, thus, Joel rarely received consequences for this behaviour. Occurrences of inappropriate touching were reported to occur least during individual work, or while Joel was focused on a task. Joel's teacher reported that his behaviours were usually ignored by peers.

The teacher interview revealed that class interruptions were reportedly occurring at a high rate. Interruptions were in the form of calling out, blurting out the answers to questions, and interrupting other students/teacher while talking. This behaviour was particularly disruptive as it was reported to interrupt the whole class. Joel's teacher noted that any form of discussion would be interrupted, and would continue until Joel received attention or a consequence. According to the classroom teacher interruptions were most likely to occur during reading group sessions. Joel was least likely to interrupt the class during art and computer activities.

Complaining was another behaviour that Joel's teacher reported as disruptive. Writing tasks were said to be a main trigger of this behaviour. Complaints were reported to occur less frequently during tasks that Joel found easy and/or enjoyable, for example art and the computer.

Crying was reported to occur much less frequently than the other behaviours, however Joel's teacher noted that it worried her as it was not age appropriate. Joel's teacher stated that Joel cried when he was unable to perform a task. This was reported to occur during low-preference activities, for example physical-education.

**Brad.** Brad's teacher described four target behaviours that she found to interfere with the classroom routine. These were touching other students inappropriately, interrupting the class, pretend shooting, pretend smoking, and constant sharpening of pencils.

Brad's inappropriate touching was described by the class teacher as pushing, kicking, hitting, and/or poking other students. Brad's teacher reported that this behaviour occurred on the mat with Brad's male class-mates. Inappropriate touching was reported to occur least when Brad was seated individually or was near the class teacher.

Brad's teacher reported that Brad's frequent pencil sharpening meant that he was out of his seat a lot, this was said to have an impact on his school work. Brad's teacher stated that this behaviour was most likely to occur when a task was delivered (especially writing tasks), while it was least likely to occur during high preference activities for example computer time or art projects.

Class interruptions exhibited by Brad were reported to include, funny noises, talking loudly, calling out, and making inappropriate comments. Brad's teacher noted that there was not a specific task that seemed to trigger this behaviour.

The behaviour reported to be of most the concern to Brad's teacher was the pretend shooting and smoking. Brad's teacher stated that he would pretend to shoot peers and/or

objects. Brad would also pretend to smoke imaginary cigarettes. These behaviours were reported to occur with his peers away from the class teacher.

### ***Questionnaires***

In addition to the teacher interviews teachers completed the Problem Behaviour Questionnaire and the Disruptive Behaviour Disorders Rating Scale-Teacher Form.

***Joel.*** Results of the Problem Behavior Questionnaire revealed that Joel's teacher reported to be redirecting Joel's target behaviours 90% of the time. She also reported that Joel's peers were responding in some way to his behaviour 90% of the time, and that these were the same peers 90% if the time. It was reported that Joel was disruptive in order to obtain teacher attention while working with other students 100% of the time, and that Joel's target behaviour would occur throughout the day once a disruptive episode had occurred. Joel's teacher reported target behaviour to occur 50% of the time when, Joel received a task demand, following a class conflict, and when the routine was disrupted. The Problem Behavior Questionnaire showed that Joel's target behaviours would rarely cease if he was ignored, and/or an activity was ended. It also showed that Joel's teacher perceived his target behaviour as a way to gain access to attention from peers and the teacher.

The Disruptive Behavior Disorders Rating Scale- Teacher Form showed that Joel "often" or "very often" ("often", score of 2; and "very often", score of 3) failed to pay attention to detail, did not follow instructions, was unorganised, avoided tasks, was easily distracted, talked excessively, blurted out answers to questions, had difficulty waiting, deliberately annoyed other people, argued, blamed others, was often angry and resentful, and was easily annoyed. Joel scored low (never: 0) on those questions directly related to hyperactivity, suggesting that this was not perceived as a problem within the classroom.

***Brad.*** The Problem Behaviour Questionnaire showed that the teacher perceived Brad to gain access to peer attention 90% of the time, while also showing that the teacher perceived to be redirecting Brad's target behaviour 90% of the time. Brad's target behaviour was perceived to persist when a request to perform a task was made 75% of the time, while also occurring during specific activities. The Problem Behavior Questionnaire showed that Brad's target behaviours were perceived as more likely to occur following unscheduled events or class disruptions, it was also reported that Brad's behaviour would stop 50% of the time if a task request was terminated or an activity was stopped. Brad's teacher also stated that 50% of the time Brad's target behaviours were perceived to result in one-on-one teacher instruction.

The Disruptive Behavior Disorders Rating Scale- Teacher Form reported Brad as “often” (score of 2) being inattentive, not listening, not following instructions, failing to finish work, unorganised, avoiding tasks, easily distracted, fidgety, avoids tasks, loses things necessary for tasks, forgetful, blurts out answers, difficulty waiting his turn, and deliberately annoyed other people. Brad was perceived to “sometimes” (score of 1) leave his seat, seemed to be driven by a motor, blamed other for his mistakes, and is easily annoyed by others. Brad was perceived as “never” (score of 0) being spiteful and vindictive, or to actively defy or refuse to comply with adults requests or rules.

### ***ABC Observations***

***Joel.*** ABC observations allowed the researcher to record the consequences that followed a behaviour. During ABC analysis Joel exhibited high rates of verbal behaviours, these predominately included; calling out, unauthorised remarks, talking when prohibited, and inappropriate noises. Consequences observed for Joel’s target behaviours included, Joel being ignored, access to teacher, and/or peer attention.

***Brad.*** Brad’s direct observations showed that peer attention and negative teacher attention were likely consequences of the target behaviours. Talking about topics unrelated to the task at hand were the most highly recorded behaviour, whereas shooting, smoking, and pencil sharpening behaviours were not observed during ABC observations.

### ***Student Interviews***

***Joel.*** Joel’s student interview suggested that he preferred to “always” work alone, and that there were “always” things in the classroom that distracted him. Joel said that he would “never” do better in school if he received more rewards, and that he “sometimes” received the rewards that he deserved when he did a good job. Joel reported that people “never” noticed when he did a good job. Joel’s most liked subjects were maths and anything that involved making things. Joel reported his least favourite subjects as spelling and writing, however he noted that while he disliked spelling he found it easy. Reading on the mat with the teacher was reported as being the hardest subject. When asked to list inappropriate and appropriate ways to get teacher attention Joel was able to provide appropriate answers. Reinforcers that Joel identified as being specific to him were; points, stickers, free-time, and computers (for school work and music). When asked what he would do with his free time Joel stated that he would like to spend time on the computers, and work on maths worksheets.

***Brad.*** In the student interview Brad reported that his work was too hard for him, but did indicate that maybe work periods were too long. Brad noted that he would “always” do

better in school if he received more rewards. When asked which subjects he liked, and which he disliked Brad reported that he did not dislike any subjects, and that he found most subjects easy. Favourite subjects listed were art, contests, cars, plants, and nature. When Brad was asked to list appropriate and inappropriate ways to gain teacher attention he could do so easily. Brad listed putting his hand up as an appropriate way to gain access to teacher attention, while yelling across the room was reported as an inappropriate way gain teacher attention. Reinforcers that were identified in the interview were; toy cars, chocolate, Fruit Bursts, and free-time. Brad noted that he did not have access to much free-time within the classroom. Highly preferred activities that were listed to do during free-time were computers, weeding, and playing on the playground.

### ***Baseline and Intervention***

Figure 1 shows the total frequency of behaviours exhibited by Joel and Brad over the baseline and intervention sessions. Each session was a 40 min observation. Once stable baselines were established intervention strategies were introduced, intervention sessions were alternated with sessions with baseline. Here these alternating baseline sessions are referred to as no intervention.

During baseline Joel's target behaviours ranged from a frequency of 40 to 81, with a mean of 57. During the initial baseline phase Brad's target behaviours ranged from 13 occurrences, to 105, with a mean of 51 per session.

The first intervention (peer support) for Joel resulted in target behaviours as low as 15 per session, with a mean of 23. However, on one occasion baseline data were very similar to those in sessions 13 and 14 differing by only 4. The sessions in which there was no intervention gave similar data to that observed during initial baseline with a mean of 58. Intervention 2 for Joel, the token economy, resulted in a decrease in target behaviour compared to the peer support intervention. Figure 1 showed that target behaviour was as low as 7, with a mean of 11 behaviours. Sessions with no intervention had data similar to that observed during the initial baseline, with a mean of 51 behaviours per session. However one no intervention session had only 19 occurrences of target behaviour.

As Figure 1 shows once the tokens had been introduced for Joel, the alternating peer support sessions decreased target behaviours. The subsequent combination of the two interventions saw a further decrease in target behaviours, however this decrease was similar to that of the token system, with a mean of 8.7 behaviours. When the teacher returned to typical classroom routine (no intervention, and return to baseline) Joel's target behaviours

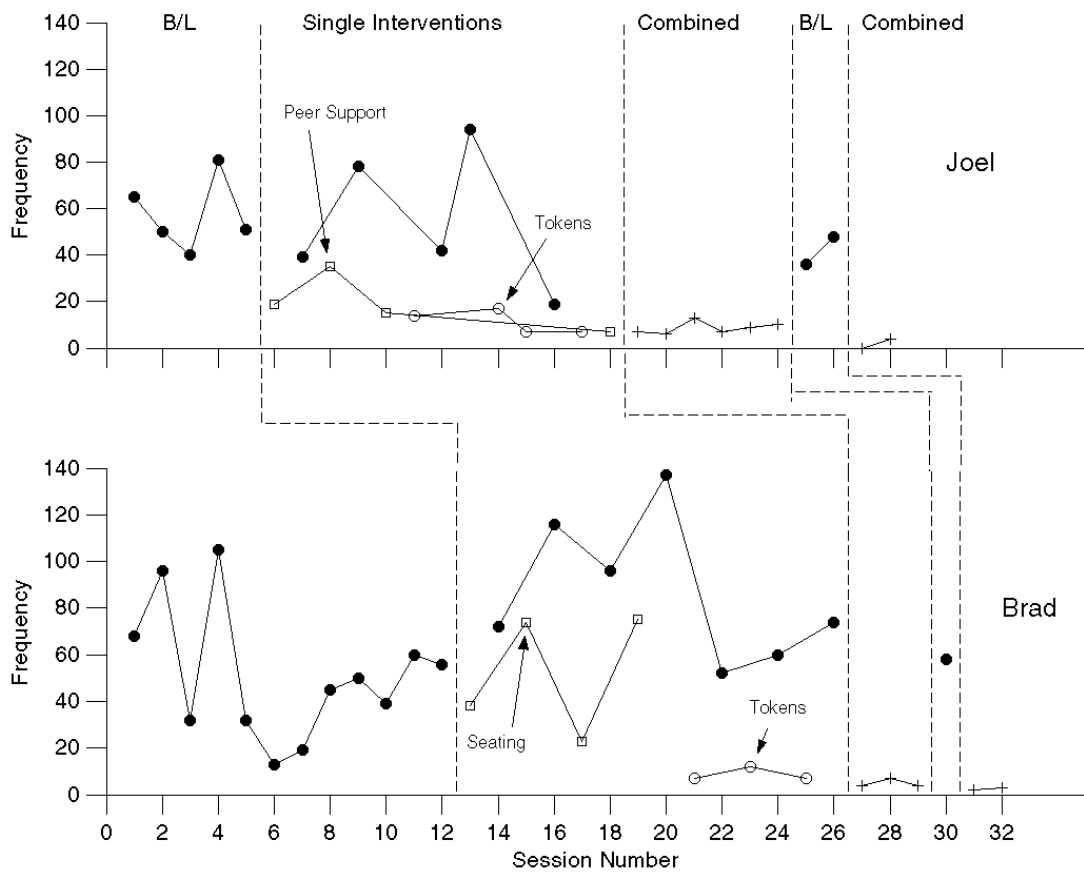


Figure 1. The frequency of the occurrences of all target plotted against session numbers for Brad and Joel. The filled in circles show data from sessions on which there was no intervention, the unfilled squares show data from the first intervention implemented, the unfilled circles represent the second intervention, and the + shows data sessions when the interventions were combined.

increased, with a mean of 42, becoming very similar to initial baseline data. When the combined interventions were reintroduced target behaviours decreased to less than they had been previously.

Intervention 1 for Brad, seating, resulted in a small decrease in target behaviours compared to the alternating no intervention sessions with a mean of 52, however the data were very similar to the initial baseline mean of 51. Sessions with no intervention resulted in an increase in target behaviours, with behaviours reported as high as 137. As Figure 1 shows, session 14 was the first no intervention session during the first intervention (seating), and the data were 72 target behaviours per session, session 15 (seating) gave similar data.

Intervention 2 for Brad, the token economy, resulted in a decrease in target behaviours, data were reported as low as 7, with a mean of 8 behaviours per session. The sessions in which no interventions were implemented also decreased when the token economy was introduced to as low as 52. Figure 1 showed that when the two interventions were combined for Brad there was a further decrease in target behaviours with a mean of 5 behaviours. During the return to baseline target behaviours increased to 58. When the combined interventions were reintroduced target behaviours decreased to less than they had been previously.

Figure 2 shows the frequency of Joel's target behaviours for each condition. Each panel shows a different treatment condition. Off-verbal (filled in circles) behaviour was consistently high throughout baseline and when no intervention was in place (with the exception of session 19). Intervention 1 (peer support) resulted in a decrease in target verbal behaviours, other target behaviours were low. Intervention 2, the token economy, resulted in a further decrease in target verbal behaviours, again all other target behaviours were low. The combined intervention resulted in a further decrease in verbal behaviours, however Off-M-Toy (unfilled square) behaviours were a little higher than during Interventions 1 and 2. With the return to baseline (top graph), there was an increase in target verbal behaviour. These decreased again once the combined intervention was reintroduced (bottom graph). Figure 3 shows the frequency of Brad's target behaviours for each condition. Each panel shows a different treatment condition. Brad's target verbal behaviours (Off-Verbal, filled in circles) were shown to be the highest frequency behaviour during baseline and when no intervention was in place. Intervention 1 (seating) resulted in a decrease in all target behaviours compared to the initial baseline except for target verbal behaviours. Figure 3 showed that verbal behaviours were seen to increase in comparison to the initial baseline

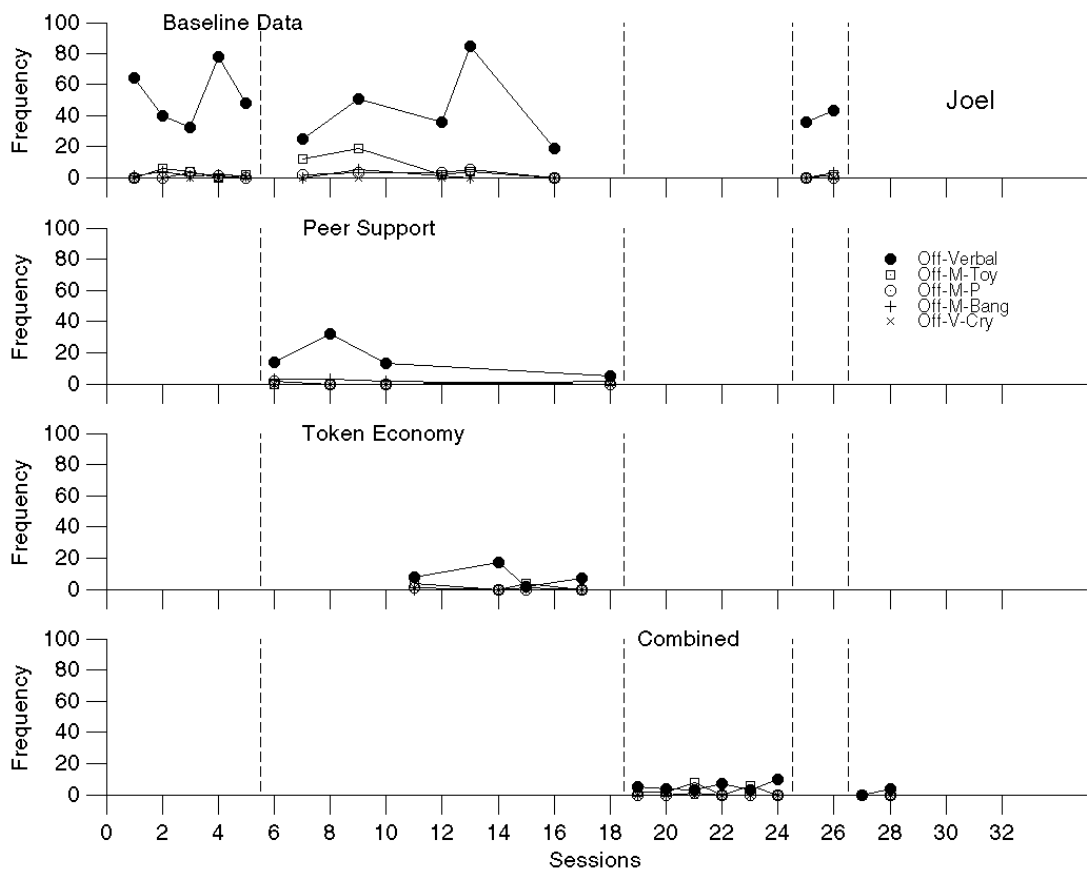


Figure 2. The frequency of each individual occurrence of target behaviour plotted against session numbers for Joel. The top panel shows data when no intervention was in place, the second panel shows data when the peer support intervention was in place, the third panel shows data when the token economy was in place, and the bottom panel shows data for the combined interventions.

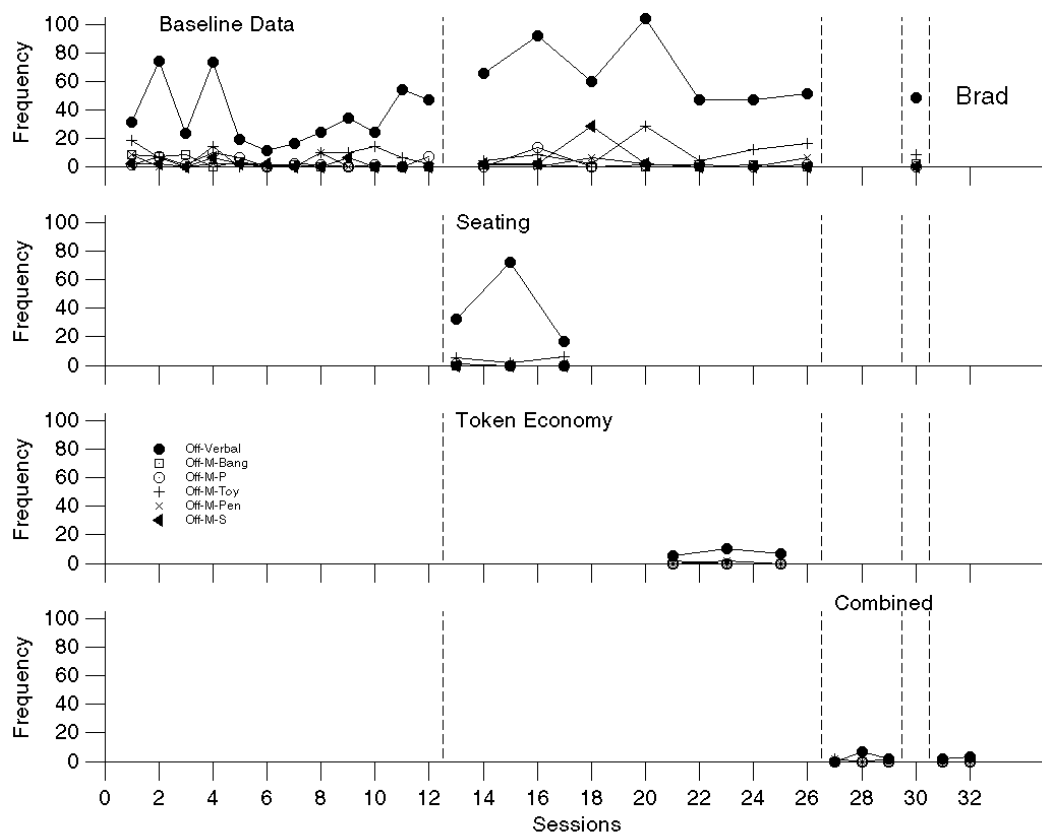


Figure 3. The frequency of each individual occurrence of target behaviour plotted against session numbers for Joel. The top panel shows data when no intervention was in place, the second panel shows data when the seating intervention was in place, the third panel shows data when the token economy was in place, and the bottom panel shows data for the combined interventions.

during session 15 (seating), sessions with no intervention were also reported to increase in frequency. The token economy resulted in a decrease in verbal behaviours; all other target behaviours were low. The combined interventions showed results similar to those during the token economy. With the return to baseline (top graph) target verbal behaviours increased. Target behaviours decreased when the combined interventions were reintroduced (bottom graph).

### ***Inter-observer Reliability***

Inter-observer observations were conducted across 28.5% of sessions for Joel and inter-rater reliability was calculated at 89.5%. Inter-observer observations were conducted across 25% of sessions for Brad and inter-rater reliability was calculated at 88.75%.

### ***Treatment Acceptability***

***Joel.*** The classroom teacher completed the IRP-15, a questionnaire assessing the acceptability of each intervention which was implemented in the class. Results of the overall treatment acceptability of the peer support system reported by Joel's classroom teacher allocated a total acceptability score of 87 out of a possible 90 indicating that she found the peer support system very "effective and efficient". She commented that the intervention was "very useful and easy to manage in a class situation". Joel's teacher also commented that Joel would actively seek a peers help.

The token system scored lower than that of the peer support system, receiving a total acceptability score of 70. While the token economy was effective in decreasing disruptive behaviour Joel's teacher noted that it required "full teacher attention to his behaviour to ensure he [was] rewarded appropriately [and] this was sometimes difficult in a classroom situation".

***Brad.*** Brad's teacher reported a total acceptability score of 7 for the seating intervention. Overall she thought the intervention was effective, however, she reported that the intervention could have been more effective in decreasing disruptive behaviour. The token economy intervention that was implemented to decrease Brad's target behaviour due to negative teacher attention received a score of 57.5 points. Brad's teacher reported that she had some concern about "prizes caus[ing] problems with the other children, perceiving the child as privileged over [the other students]". She also noted that it was hard to implement the tokens while working with other students, and that the token economy did not result in a significant change of behaviours when the token economy was not in place. As discussed

earlier Figure 1 showed that when no intervention was in place target behaviours were higher than those observed during baseline.

### ***Student Intervention Rating Profile***

***Joel.*** The students also filled in questionnaires (the children's Intervention Rating Profile, Witt & Elliott, 1985) that assessed the acceptability of each intervention. For the peer support intervention Joel's rated the intervention 34/42, indicating that Joel found the intervention to be acceptable. The token economy scored an acceptability rating of 39/42. This showing that the token economy was highly rated by Joel.

***Brad.*** Brad's acceptability rating was 35/42 points for the seating intervention. Brad "strongly disagreed" that the intervention caused any problems with his friends. The token economy used with Brad was also rated highly, receiving 41/42. Brad gave the highest acceptability scores for six of the seven questions, providing a high acceptability rating for this intervention.

## Discussion

This study examined whether it was feasible to conduct functional assessment, functional analysis, and subsequent interventions with children with ADHD within a general education classroom comprising more than 25 students and if the intervention would produce positive behaviour changes. Results showed that not only was it feasible but that the teachers were able to implement the resulting behaviour plans effectively.

As in Hoff et al. (2005), the assessment and intervention design were a collaborative effort between the researcher and the classroom teacher. Thus the teachers were consulted during the observational stage and were involved in developing possible functional hypotheses and the interventions. The intervention process was implemented entirely by the classroom teachers while the teachers continued with the normal classroom schedule.

As in Hoff et al. (2005) the two interventions were combined to evaluate the combined effects. The peer support intervention (Joel) and the seating intervention (Brad) were effective in reducing target behaviours, when compared to no intervention; however, the reduction was greater with the token economy for both students. However, social-acceptability questionnaires revealed that the token economy was not as accepted as the seating and the peer support interventions by the class teachers, while both students rated the token economy highly. This was most evident for Brad and his teacher as the seating intervention was rated higher than the token economy by the classroom teacher; however the seating intervention produced results similar to that observed during no intervention conditions in session 15.

In the current study both interventions for Joel proved effective. While for Brad the token economy was more effective than the seating change. Hoff et al. (2005) hypothesised that combining two interventions would decrease target behaviours further than either intervention alone, Hoff et al. (2005) found this was the case. These results, however, were not clearly replicated in the present study, although a small decrease in target behaviour occurred when interventions were combined the decrease was not enough to argue for an additional effect of the combination. This could have been due to the fact that the token economy was so effective there was not much room for a further decrease in target behaviour from either student. Also the token economy provided tangible reinforcement, and thus the reinforcers may have been more effective in reducing target behaviours. Therefore, the results

from the present study suggest that combining classroom interventions may not result in a further decrease in target behaviour.

This study addressed several limitations of previous research these will now be discussed.

### ***Teacher's role***

As reported earlier the teacher's roles in much of the research is often limited to providing information during the descriptive analysis (interviews, direct observations, and questionnaires). There is, however, some literature in applied settings that involves teachers in implementing the analysis and interventions. Ervin et al. (1998) used a collaborative consultation model wherein teachers participated in all phases of the functional assessment. Ervin et al. (1998) however conducted this study within Boy's and Girl's Town, a community-style residential treatment facility. It is possible that class teachers might be more willing in such a facility to participate in research as they specialised in treating behaviour problems. Ervin et al. (2000) and Hoff et al. (2005) also showed that it was possible to implement a functional assessment and intervention with the class teacher playing a role in the process. Such teacher involvement allows class teachers to assess the function of target behaviours and thus design positive behavioural interventions for their students. If teachers are taught the methods of functional assessment less time would be required of professionals, and interventions may be implemented before target behaviours escalate. This present study adds to this research as both Brad and Joel's teachers successfully provided information for hypothesis development during the interview phase of the functional assessment, and served as collaborative partners in the discussion and implementation of possible hypotheses and intervention strategies. They also implemented the selected interventions.

Social acceptability questionnaires reported that both teachers thought that other teachers would find the functional assessment process and subsequent intervention appropriate for behaviour problems, and that they would suggest the use of functional assessment, and the intervention implemented to other teachers. Both teachers agreed that the child's behaviour was severe enough to warrant the use of functional assessment and the subsequent intervention.

A majority of the studies that looked at functional assessment within the classroom conducted treatment acceptability questionnaires. For example Hoff et al. (1998) used the IRP-20 to assess acceptability of the functional assessment and subsequent interventions. Hoff et al. (2005) noted that the overall treatment acceptability ratings completed by the class

teachers for the combined interventions were high. In the present study the IRP-15 was used to assess treatment acceptability in place of the IRP-20 as the IRP-20 includes questions about the time it took to select an intervention, here the researcher selected the interventions. Questionnaires were completed by the class teachers for each intervention. This allowed the researcher to see which intervention was more acceptable. The Children's intervention rating Profile was used to assess the acceptability of each intervention, however the younger participants found the scale hard to follow and needed assistance from the class teacher to complete the form. Future research should focus on developing forms that are easier for children to complete without assistance from a class teacher.

In the present study the teachers rated the intervention that was more successful, (token economy) at decreasing target behaviour, as less acceptable than the other interventions that were implemented (peer support and seating). Information collected from social acceptability questionnaires showed that the teachers had concerns about the token economy, these were; that it required full teacher attention to the student's behaviour to ensure students were rewarded appropriately and this was sometimes difficult in a classroom situation. The teachers also had some concerns about reinforcers causing problems with the other children, perceiving the child as privileged over the other students. It was also noted that the token economy was hard to implement while working with other students, and that the token economy did not result in significant change of behaviours when it was not in place. Thus, one could conclude that the token economy received a lower acceptability rating due to concerns with the ease of the implementation of the intervention rather than the effect that it had on decreasing problem behaviour while implemented. Recommendations for future research would be to create a "teacher friendly" economy that does not require full teacher attention, and requires little to no tangible reinforcement.

### *Class size*

Hoff et al. (2005) noted that class size was a limitation of their functional assessment, in that the class only comprised of 14 students. This could have made the functional assessment and subsequent intervention easier to conduct and may have contributed to higher treatment acceptability from the classroom teacher. In this study the regular classroom needed at least 25 students. Present studies have implemented functional assessment in classrooms in which there were a small number of students thus questioning the use of functional assessment in classrooms which contain a larger number of students. This study showed that functional assessment, analysis, and subsequent interventions can be successfully

implemented in a classroom in which there are a larger number of students. This shows promise for the use of functional assessment in choosing and implementing interventions that address the function of a behaviour to decrease target behaviour in mainstream classrooms.

### ***Data Collection***

One difference between the current study and that conducted by Hoff et al. (2005) was that Hoff et al. (2005) used interval recording to collect data on the target behaviours. Interval recording allows the researcher to see whether the target behaviour occurred or did not occur during a pre-determined time period. The present study looked at the frequency of behaviours, this allowed the researcher to see the rate of each target behaviour, and how each intervention affected each of the target behaviours. For example as we discussed earlier Brad's verbal behaviours were seen to increase in comparison to the initial baseline during session 15 (seating), sessions with no intervention were also reported to increase in frequency. However when intervention 2, the token economy, was introduced behaviours were reported to decrease.

In the Hoff et al. (2005) study observations were conducted across a 45 min class, however, Hoff et al. (2005) only focused on the times when the teacher was not attending the class as this was when the target behaviours were hypothesised to occur. Therefore, Hoff et al. (2005) only used 10-15 minutes of each 45 min session. The present study looked at 40 min blocks hypothesised by teachers as being the most disruptive, and recorded the target behaviours were recorded across the whole 40 min session.

### ***Analogue settings***

This study contributes to the existing literature as it provides an example of the use of functional assessment and analysis in a normal classroom, other such research has used analogue settings to evaluate behavioural function. As we have already noted the majority of functional assessment studies to date have focused on developmentally-delayed participants in contrived settings (Lewis & Sugai, 1996). This experiment also shows the effective use of functional assessment and analysis within a larger classroom.

### ***Limitations***

There are several limitations to the present study, these will now be discussed. First, the effectiveness of the interventions were not evaluated for maintenance or follow-up. Future recommendations would be to follow-up interventions, and to teach teachers how to maintain each intervention, for example, a student may reach satiation with a particular

reinforcer, therefore making the intervention ineffective. Here preference assessments could be conducted by the teacher weekly to assess the potency of each reinforcer.

Second, the focus of the study was on increasing on-task behaviour and decreasing disruptive behaviour. The nature of the teaching plan implemented within the classrooms did not allow data to be collected on academic achievement as lessons were often during different times of the day, and the nature of each academic activity often comprised of very different characteristics. Therefore, no data were available on academic achievement. This has implications as we were unable to assess whether the decrease in target behaviours lead to an increase in academic achievement.

Third, the functional assessment resulted in the design of intervention strategies to decrease target behaviours. However, direct observations and the functional assessment were a lengthy process, for example Brad's functional assessment alone required 32, 40 min sessions. This questions whether a classroom teacher would be able to conduct a functional assessment to access the function of target behaviour without help from other school, or specialist personnel. What is needed is a faster way in which functional assessments can be conducted in the class environment to make it feasible for the teachers to do within time restraints.

The next Experiment examined functional assessment involving the class teacher in a regular classroom using the Motivation Assessment Scale (MAS) to assess the function of target behaviours. Experiment 2 looked at making functional assessment more accessible for classroom teachers. Experiment 1 showed that the functional assessment was a lengthy process that a teacher would have difficulty finding time to implement effectively within a classroom.

## Experiment 2

Matson and Minshawi (2007) report that “the labour-intensive nature of [functional assessment] procedures and the high level of expertise needed to carry out the methods have limited its utility” (p.356). These limitations have led to the development of methods that have the same premise as functional assessments (Matson & Minshawi, 2007). Two alternative methods are the Motivation Assessment Scale (MAS) and the Questions About Behavioural Function (QABF) scale.

Shrogren and Rojahn (2003) note that the Motivation Assessment Scale (MAS) is a rating scale consisting of 16 questions, these questions are arranged into four subscales (Attention, Escape, Sensory, and Tangible). The MAS does not require administration by the researcher. The questions are rated on a 7- point Likert type scale (0 = never, 1 = almost never, 2 = seldom, 3 = half the time, 4 = usually, 5 = almost always, 6 = always) (Shogren & Rojahn, 2003). The QABF scale consists of 25 items, each item is rated on a 4-point likert-type scale (x = does not apply, 0 = never, 1 = rarely, 2 = some, and 3 = often). These are arranged into five subscales: escape, attention, non-social, tangible, and problem behaviour related to pain (Matson & Minshawi, 2007).

Shogren and Rojahn (2003) compared key psychometric properties of the MAS and the QABF. Inter-rater reliability for the QABF subscales ranged from fair to good, inter-rater reliability of the MAS subscales ranged from poor to good. Retest reliability for the QABF varied from .62 to .93 across subscales, for the MAS, they ranged from .71 to .89. Internal consistency of the four subscales were; .82 to .88 for the QABF, and .80 to .96 for the MAS. Shrogren and Rojahn (2003) found that the QABF and the MAS were very similar in terms of their reliability measures, but there were problems with inter-rater reliability. Shrogren and Rojahn (2003) note that clinical results reported by the QABF or the MAS should not be used in isolation, that is functional assessment techniques should also be adopted.

Durand and Crimmins (1988) developed the MAS “to assess the relative influence of social attention, tangibles, escape, and sensory consequences on self-injury” (p.100). The MAS determines where a target behaviour is most likely to occur and the function that it is likely to serve for the individual. Durand and Crimmins (1988) looked at the inter-rater and test-retest reliability of the MAS and how well it was able to predict self-injurious behaviour (SIB). When compared to the timely procedures of functional assessment the MAS provides a

less time consuming, and more practical method of assessing behavioural function (Sigafoos, Kerr, and Roberts, 1994).

Participants were 50 developmentally disabled children with frequent self-injurious behaviour. Students and teachers were selected from six schools, this allowed for evaluation over a larger population. Students were selected if they displayed frequent SIB.

The MAS was administered to a primary (teacher) and secondary (assistant teacher) rater for each child. Inter-rater reliability for the individual questions were .66 to .92, while reliability for the four main categories were .66 to .81. Test-retest reliability was assessed by administering the MAS to the primary rater again 30 days following the initial administration. Test-retest reliability correlations ranged from .89 to .98. Responses from each of the 16 questions on the MAS were recorded from both the primary and secondary raters for each of the 50 children. Pearson correlation coefficients were all significant at the .001 level. MAS data for the 50 students showed that tangible consequences were the most frequently cited motivation (48%), followed by escape (18%), attention (17%), and sensory (17%). Durand and Crimmins (1988) reported that the “[d]ata from the inter-rater and test-retest reliability assessments indicate[d] that the MAS was a reliable instrument” (p.104).

Sigafoos et al. (1994) looked at the effectiveness of the MAS when used to predict behavioural function of aggressive behaviours. Participants were 18 clients, functioning “in the severe to profound range of intellectual disability” (p.336). All participants displayed severe aggressive behaviours.

Two staff members for each client completed the MAS, the researcher showed the staff how to use the scale, and that the reason for completing the MAS was to determine the function of an individual’s aggressive behaviour. Firstly, Pearson correlations were used to assess agreement between the different raters. Next, Spearman rank-order correlations were calculated to determine agreement of the behavioural function. Pearson correlation scores were non-significant. Negative Spearman correlations were obtained when inter-rater reliability was assessed. These results suggested that the MAS may not be a reliable method to identify the behavioural function of aggression.

Other interviews and questionnaires are available for the use with ADHD populations, however many are time consuming and/or require a professional to interpret the questionnaires. For example Hoff et al. (2005) used the Functional Assessment Interview described by O’Neill et al. (1997), this interview is nine pages long, and requires the teacher to observe and record occurrences of target behaviours. The Functional Assessment Interview

asks that teachers include what the behaviours look like, their frequency, and how intense the behaviour is. Thus, this interview is time consuming, and is only part of the descriptive assessment used in functional assessment. Questionnaires are also used with ADHD populations to develop functional hypotheses, for example Experiment 1 used the Disruptive Behavior Rating Scale-Teacher Form (Barkley, 1997), and the Problem Behavior Questionnaire Form (Lewis et al., 1994) in the descriptive assessment of the functional assessment, however these forms require a professional to conduct the questionnaire, and to interpret the questions, and are usually used alongside direct observations.

The MAS is much shorter and easier to use than these interview schedules. An advantage of the MAS over the QABF, is that the MAS is available for free use on the internet, <http://monacossociates.com/mas/aboutmas.html>, most teachers in New Zealand now have internet access. Thus it was decided to examine the MAS further, to see if it would provide a quicker means of hypothesis development that would be simpler and more accessible to teachers. Thus it was used alongside the functional assessment in this next study. Thus, this next study investigates the effectiveness of the MAS in predicting the function of a student's target behaviours in a mainstream classroom. The MAS results were compared directly to functional assessment observational methods. It was hypothesised that the hypothesis developed by the MAS would match that of the functional assessment. However, as Sigafos et al. (1994) noted that the MAS may not always be a reliable method for identifying behavioural function. Thus if the hypotheses were not compatible, given the fact that functional assessment is the best practice it would be unethical to implement an intervention based on the results of the MAS. In this case the interventions were based on that of the functional assessment conducted simultaneously by the researcher.

Self management is an intervention that has been successful in decreasing problematic classroom behaviours (Gureasko- Moore, Dupaul, & White, 2006). "Self-management describes a number of methods used by students to manage, monitor, record, and/or assess their behaviour or academic achievement" (Reid, Trout, & Schartz, 2005, p.362). A number of studies have demonstrated positive effects of self-management interventions in schools environments with ADHD children (e.g., Reid et al., 2005; DuPaul & Hoff, 1998; Davies & White, 2000). Gureasko-Moore et al. (2006) note that self management techniques require little effort from classroom teachers, has the ability to generalise across settings, while allowing students to become more aware of target behaviours and take responsibility for their own behaviour.

As was found in Experiment 1 the most effective intervention was not as socially accepted by the teachers as the less effective intervention because it was harder to implement. It was recommended that future research should attempt to create a “teacher friendly” intervention that does not require full teacher attention, and requires little to no tangible reinforcers. Thus the teacher friendly method could involve self-reinforcement and/or a self-management system; where rather than the teacher providing reinforcers to the student, the student could deliver reinforcers to themselves. Thus, the process would become less time consuming for the class teacher, while still providing effective reinforcement to the student. Reinforcement could be in the form of cards, tokens, marbles, stickers, and other student specific reinforcers. The aim here was to provide interventions that would take no more time to implement within a classroom setting than the teachers were already spending. Thus, interventions in Experiment 2 aimed to involve more student collaboration depending on the hypotheses derived from the functional assessment.

## **Method**

### ***Participants and Setting***

The same recruitment process as Experiment 1 was used to find potential participants. The participants’ parents and/or guardians were provided with informed consent (see Appendix 4) and were required to send back the consent forms (see Appendix 5). Once consent was received the functional assessment process was started.

The participants in this study were Amy and Callum. Amy was an 8 year-old girl who exhibited high rates of non-compliance. Amy had a diagnosis of ADHD and was taking medication throughout the study. She received Ritalin twice daily up until session 11. Her medication was then changed to one slow release of Ritalin each morning (Amy’s dosage was not known to the researcher).

Callum was a 7 year-old boy who was also diagnosed with ADHD. Callum received 10mg of slow release Ritalin each morning before school, Callum also continued taking his medication throughout the study.

This study was conducted in two general education classrooms as in Experiment 1. Amy’s class consisted of 28 students, and one teacher. Amy received the help of a teacher aide for 8 hours per week. Amy’s teacher applied the school wide consequences system using behaviour cards. Each card was located in a paper pocket on the wall, each side of the card had a different coloured sticker and each sticker represented a consequence. Green

represented good behaviour, blue represented a warning, yellow represented class time-out, red represented buddy time-out, and white represented a trip to the principles office and a phone call home. Students received a “click” when they exhibited good behaviour. Each student had a card with 50 squares on it, at the end of each day the students whose cards were still green would receive a “click” (a hole punched out of their card). Once 50 holes (clicks) were gained the teacher gave the students a tangible reward, for example a lollipop. This was in place throughout the study.

Callum’s class comprised of 27 students and 1 teacher. There was also a teacher aide in the classroom 10 hours a week, however, she was assigned to another student. Callum’s teacher had implemented a response cost token system to try and control Callum’s aggressive behaviour in the playground, however no system was in place to reduce target behaviour within the classroom. The response-cost system required Callum to start each day with 10 tokens on the whiteboard, each token represented one minute of computer time. Every time Callum’s teacher was told about an incident in the playground involving Callum she would take him aside and speak to him about it. If he had been involved she would remove one of his tokens from the whiteboard therefore decreasing the amount of time he had on the computer at the end of each day. This intervention was reported to work well for all involved and was implemented throughout the course of the study. No data was available on this particular intervention.

## **Procedure**

### ***Materials***

The descriptive assessment included the Functional Analysis Interview Form (Packer, 2001-2006), the Student Assisted Functional Assessment Interview (Kern et al., 1994), the Motivation Assessment Scale (MAS), and ABC observation forms. Data were collected using the Behaviour Observation program (BOB) and a palm pilot. The palm record was used to record variables that may affect the target behaviours. Social acceptability was assessed using the Intervention Rating Profile (IRP-15, Witt & Elliott, 1985), and the Student Intervention Rating Profile (Witt & Elliott, 1985).

### ***Interviews***

Teacher interviews were administered to the teacher by the researcher in an empty classroom (see Appendix 17). The teacher interviews were a shorter version of those used in Experiment 1 based on the Functional Analysis Interview Form (Packer 2001-2006) and focused on the occurrence and non-occurrence of target behaviours. Teacher interviews were conducted prior to any direct observations.

### ***Direct Observations***

ABC observations were conducted by the researcher to observe the occurrence and non-occurrence of target behaviours, as well as the antecedents (what happened before the target behaviour occurred) and consequences (the consequence/s that resulted from the behaviour) surrounding that behaviour. ABC's were recorded on a behavioural observation form (see Appendix 10). Direct observation data for Amy's off-task behaviour were collected over four days across six 30 min sessions. Direct observation for Callum's off-task behaviour were collected over five days across seven 30 min sessions.

### ***Motivation Assessment Scale (MAS)***

Each student's teacher was asked to log on to the MAS website and answer a series of questions about each student's target behaviours. The MAS was used to produce possible hypotheses from which the interventions would be based upon.

### ***Operational Definitions***

Target behaviours were divided into two categories; Off-task motor, and off-task verbal. Off-task motor behaviours were defined as any instance of motor activity that was not directly associated with an assigned task. Off-task verbal behaviours were defined as any vocalisations that were not permitted and/or were not related to an assigned academic task. In

this study a third category was required as both students exhibited non-compliance, this was defined as ignoring any direct instruction delivered by the classroom teacher. Specific definitions were then developed for each child.

**Amy.** Amy's off-task motor behaviours were defined as the occurrence of; engaging in any physical act which causes harm and/or discomfort to another person, or by restricting that person's freedom of movement. Peers were required to show some form of discomfort for the interaction to be recorded as a problem behaviour. Engaging with materials that were not directly related to the task at hand was also counted as an off-task motor behaviour. Amy exhibited no off-task verbal behaviours that were of direct concern to the classroom teacher or the researcher. Amy did however exhibit high rates of non-compliance, this was defined as directly ignoring (not complying within 5-s of the task demand) instructions given by the classroom teacher and/or other adult (see Appendix 18 for operational definitions).

**Callum.** Callum's off-task motor behaviours were defined as the occurrence of: engaging in a physical act which causes harm and/or discomfort to another person, or by restricting that person's freedom of movement. Peers were required to show some form of discomfort for the interaction to be recorded as a behaviour. Engaging with materials that are not directly related to the task at hand was also recorded as an off-task motor behaviour. Callum's off-task verbal behaviours were defined as; Making any audible sound, such as whistling, humming, forced burping, laughing to self, singing to self, and/or weird noises. Calling out answers to academic problems when the teacher had not specifically asked for an answer, or permitted such behaviour, calling out across the room to other students and/or teachers, interrupting other students when they are speaking while in a group situation, interrupting other student's conversations, and inappropriate volume for task at hand were all classed as off-task behaviour. Callum's non-compliance was defined as directly ignoring (not complying within 5-s of the task demand) instructions given by the classroom teacher and/or other adult (see Appendix 18 for operational definitions).

### ***Data Collection***

The same data collection method as experiment 1 was used.

### ***Student interviews***

The student interviews were identical to those used in Experiment 1.

### ***MAS hypotheses***

Hypotheses were developed from the MAS results (see results section) these were, Amy's target behaviours functioned to gain access to tangible items. The MAS hypothesised that Callum's target behaviours were maintained by attention.

### ***Hypothesis Development***

Based on the information collected during the descriptive functional assessment (interviews and direct observations) a tentative hypothesis was developed, this hypothesis was then compared to that comprised by the MAS. It was hypothesised that the hypothesis developed by the MAS would match that of the functional assessment.

**Amy.** Information gathered from the teacher interview and direct observation indicated that attention was the function of Amy's target behaviour.

The teacher interview revealed that compliance was least likely to occur on the mat and during transitions. Direct observation showed that Amy rarely followed direct instructions and this non-compliance was met with repeated requests from the classroom teacher, and/or having her card flipped (see participants and setting). Direct observation revealed that when her card was flipped Amy would become aggressive and/or upset, and the class teacher would then ignore her and continue teaching the rest of the class.

**Callum.** Information collected from the interviews and direct observations pointed to attention as being the primary function of Callum's off-task behaviour. The teacher interview revealed that Callum was most likely to act out during group situations, for example when he was seated on the mat, or during a group activity.

Direct observations of Callum's behaviour showed that most occurrences of off-task behaviour were met with either peer and/or teacher attention. Given the information gathered from the teacher interview, direct observations, and in discussion with the classroom teacher it was hypothesised that Callum's off-task behaviours allowed him to gain access to attention.

### ***Intervention Hypotheses***

The specific hypothesis for Amy's target behaviour read; "Amy engages in non-compliance to gain access to negative teacher attention". The specific hypothesis for Callum's off-task behaviour was "Callum engages in off-task behaviour to gain access to peer and/or teacher attention".

### ***Intervention(s)***

Hypotheses were formed from the descriptive data collected during the functional assessment. A meeting was held with each teacher to discuss the tentative hypotheses.

**Amy.** To address the functional hypothesis that attention was the maintaining variable for Amy's target behaviour two interventions were planned. While the token economy in Experiment 1 was effective in reducing target behaviours, it required too much time and effort from the teachers. Gureasko-Moore et al. (2006) stated that limitations of token economies were that they required an external agent (i.e., the class teacher) to deliver consequences to manage the target behaviours, thus the demands on teachers time and effort to implement such procedures reduce available instructional time. The first intervention was similar to a points system. Amy's teacher and/or teacher aide would instruct Amy to draw a "smiley face" on her chart each time she promptly followed a direct instruction. Rather than teachers delivering the smiley face and wasting valuable class time Amy was instructed to give herself a smiley face. Once a predetermined number of "smiley faces" were gained Amy was reinforced with a small card, once five cards had been gained Amy received a tangible reinforcer. This intervention was named the Good Behaviour Game (GBG) and was known throughout the classroom as "smiley faces". This intervention served as an easier version of the token economy implemented in Experiment 1, here rather than the teacher delivering the tokens and/or points, Amy gave herself a smiley face upon teacher instruction. Thus, Amy was effectively in charge of keeping track of her smiley faces, informing the teacher when she achieved criterion.

The GBG rules were as follows: (1) Implemented from 9.00am-12.30pm. (2) Each instruction that was followed within 5-s received a smiley face. (3) Amy's teacher, Amy's aide, and Amy could all place smiley faces on the chart, however only Amy's teacher and Amy's aide could instruct Amy to give herself a smiley face. (4) When five smiley faces had been gained, Amy received a coloured card to place in her pocket. (5) When five cards were in Amy's pocket she received a reinforcer. (6) Cards could be collected throughout the week. (7) Amy then chose a reinforcer from the rewards board. Possible reinforcers were; Balance board, computer time, free time, chocolate, or a class job.

It became apparent that after two weeks of implementing the intervention and Amy not having received any rewards that the GBG needed to be revised. Thus the Revised Good Behaviour Game (GBG-R) criterion was: (4) When five smiley faces had been gained, Amy

received a coloured card to place in her pocket. (5) When two cards are in Amy's pocket she received a reinforcer.

The second intervention to address the functional hypothesis was a behavioural contract. A behavioural contract is a contract that the student and the teacher develop collaboratively. The contract outlines expectations, rewards, and consequences of both parties. When both parties are in agreement the contract is signed by those involved (Wayne County Regional Education Service Agency, 2003). Here the student played an active role in the intervention process, working collaboratively with the class teacher to devise a behavioural contract.

The contract rules were: (1) Implemented from 1.30pm-3.00pm. (2) Discuss the reason for the contract and the behaviour you want to increase. In this case we want to increase Amy following direct instructions. (3) If the teacher feels that Amy has had a good day she is allocated a point. This point will be represented by a sticker on a chart. When Amy receives a predetermined number of stickers (decided on by those signing the contract) she will receive a special certificate to take home to mum where she will be rewarded at home. (3) Amy, Amy's teacher, and her teacher aide all signed the contract. (4) The contract may be renegotiated at any point upon agreement of all parties, i.e. change the reinforcers, number of points needed to receive reinforcement etc. (5) The contract will be laminated once signed and placed on the wall for Amy to revise if need be.

**Callum.** To address the functional hypothesis of attention on Callum's off-task behaviour two interventions were planned. Firstly to address the behaviours that were most prevalent, calling out and interrupting, a self-management strategy, that included reinforcement, was implemented. As Gureasko-Moore et al. (2006) reported self-management has been used in school settings to successfully decrease target behaviours. The self-management intervention required Callum to record any occurrences of calling out and/or interrupting that occurred within the classroom throughout the school day. A training session with the researcher was provided for Callum so that he was aware of instances that were considered calling out and interrupting. Each time a target behaviour occurred the researcher would instruct Callum to mark a dash in one of the squares on his self-management card.

The self-management rules were: (1) Aim for less than 15 behaviours a day. Set the goal in the morning prior to the start of the intervention, must be either the same or less than the day before. (2) Have Callum choose an array of rewards (balance board, teachers' helper,

playground time with a friend, computer time, and free time) in the morning before each session these will be what he chooses from when he achieves his goal. (3) Callum will record instances of calling out and interrupting using a tally chart and a whiteboard marker. (4) Reinforce at the end of each day. Callum will choose a reward from his rewards chart. (5) The classroom teacher will collect the self-management card at the end of each session.

The second intervention that was planned was a behavioural contract. Callum and his classroom teacher discussed the target behaviours that were to be monitored, again these were calling out and interrupting. Callum's teacher recorded Callum's instances of the target behaviour by allocating a number of counters for the day. Each counter represented one occurrence of the target behaviour. The counters were magnets placed on the white board at the front of the class, this allowed easy teacher access and allowed Callum to see when target behaviour had occurred. The right hand side of the whiteboard represented how many counters Callum had remaining for the day, while the left hand side of the whiteboard represented how many counters Callum had used (the number of times he had performed the target behaviour). If Callum still had counters remaining on the right side of the whiteboard at the end of the school day he would receive a sticker to place on his contract chart. It was planned that if Callum received three stickers in the same week he would be rewarded with a special certificate to take home where he would receive his reward. However, the teacher decided to use the same reward system as the self-management intervention as she reported that Callum responded well to immediate positive consequences. The Contract rules were: (1) Negotiate contract together. (2) Aim to decrease inappropriate calling out and interrupting. (3) Aim for less than 15 behaviours per day. Change criteria daily in discussion with Callum prior to change, must be the same or less than the day before. Do this in the morning before the intervention starts. (4) Have Callum choose an array of rewards (balance board, teachers helper, playground time with a friend, computer time, and free time) in the morning before each session, these will be what he chooses from when he achieves his goal. (5) If the criterion is met Callum will receive a sticker which can be placed on his chart. (6) Keep track of Callum's behaviours by recording the frequency of interrupting and calling out on the whiteboard. Do not worry too much if you miss the occasional behaviour. NB: Callum will not record behaviours himself during this intervention.

### ***Inter-observer Reliability***

Inter-observer reliability was conducted throughout the study. Inter-observer agreement were collected for a least 20% of the total sessions observed for both participants.

Inter-observer agreement was calculated by dividing the number of agreements between observers by the total of agreements and disagreements and then multiplying by ten.

### ***Social Validation Questionnaire (treatment evaluation)***

Consumer satisfaction questionnaires as in Experiment 1 were administered to the teachers and students (Appendix 15 and 16).

## **Results**

### ***Teacher Interviews***

**Amy.** Amy's non-compliance was reported by her classroom teacher as being of the most concern to him. The interview revealed that he felt Amy would deliberately ignore him in order to avoid task demands. Amy's teacher reported that he had to redeliver instructions, and her non-compliance was not specific to a certain task, occurring throughout the day. Non-compliance occurred most frequently when Amy was required to transition from one activity to another.

The teacher said that non-compliance was met with a verbal warning, if the behaviour persisted Amy would receive a "card flip". If the behaviour was extreme then the teacher would make a phone call home. The teacher interview also revealed that at times Amy's behaviour could become more physical, he reported that she would often take her frustration out on the other students. This behaviour was seen by the class teacher to happen more frequently while she was on the mat, and when she engaged in group activities. This behaviour was met with a verbal warning, if the behaviour persisted her card would be flipped.

Amy's constant engagement with non-related materials was also seen as a problem by the classroom teacher as she would miss vital task instructions that were needed to complete assigned work. Amy's teacher noted that she would also bring materials to school on her person that would create a constant distraction, for example large, dangly earrings, hair ties, rings, crowns, and bracelets. Whenever Amy was asked to put the materials away the teacher would be met with non-compliant outbursts (crying, complaining, arguing, and ignoring teachers and students) that would disrupt the whole class session. Thus to avoid confrontation Amy's classroom teacher would ignore the behaviour.

**Callum.** Callum's teacher reported she was constantly receiving information about him hurting other students in the playground and within the classroom. Callum's teacher had implemented an intervention to address this problem behaviour (see participants and setting).

Callum’s teacher said she was concerned about the amount of calling out, and interrupting that occurred throughout the school day. This occurred frequently and was more reported to be more prevalent on the mat and during group work. The system used within the classroom to attempt to deal with this behaviour was “Toots and Hogs” (see Table 1). Any behaviour that was a “toot” or a “hog” was met with a consequence. However Callum’s teacher stated that she was not consistent in delivering consequences for inappropriate behaviour.

Table 1

Definition of Toots and Hogs, the behaviour management strategy in place in Callum’s classroom.

<p><b>TOOTS</b></p> <p>Talking out of turn</p> <p>Interrupting</p> <p>Not putting your hand up</p> <p>Yelling out</p> <p><b>HOGS</b></p> <p>Hindering others learning</p> <p>Distracting</p> <p>Touching</p> <p>Talking to others</p> <p><b>Golden Rule</b></p> <p>Do what you are told immediately</p>
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***ABC Observations***

***Amy.*** Direct observations of Amy’s behaviour revealed that target behaviours were more likely than not to be met with attention, either positive or negative from both her peers and her teacher. Amy was observed to be constantly in contact with objects that were not task related. On one occasion she wore a crown to school and this was her focus for the entire observation period. The teacher was observed to continually ask Amy to put it away; however this request was not complied with, thus supporting the need for an intervention that would increase compliance.

***Callum.*** Direct observations of Callum’s behaviour pointed directly to attention, each occurrence of the target behaviour was met with both positive and negative attention from his

teachers and peers. Observations revealed that Callum complied with most of the requests made by his teacher, in spite of compliance this was one of the target behaviours of most concern in the initial teacher interview.

Callum showed many forms of inappropriate touching, however these were in the form of play fighting with class peers. These play fights would sometimes escalate and Callum would receive negative teacher attention, though it was observed that he was often not the one to initiate the play fight.

### ***Student Interviews***

**Amy.** In Amy's interview she stated that she would "always" do better in school if she received more rewards. She also said that there were "always" things in the classroom that distracted her like her "friends talking to her". She didn't think that her work was too hard or too easy, and she felt that people noticed when she did a good job.

Amy's favourite subject was playing games outside as a class, while maths was a subject that was sometimes disliked. Amy's favourite activities at school were playing with her friends, and swimming. The student interview revealed that she knew the difference between appropriate and inappropriate ways of gaining teacher attention.

When asked which rewards she would like to receive for good behaviour she noted "clicks", computer time, balance board, chocolate, and lollies. Amy revealed that if she had the chance she would like to play on the computer or help the teacher with class jobs.

**Callum.** Callum's student interview showed he thought that his work was never too hard for him, but sometimes it was too easy, he thought his work was never challenging enough for him. Callum stated that he "never" liked to work alone, preferring to work in a group with other students.

Callum revealed that he thought that no one ever noticed when he did a good job, except his friends who would reinforce him by saying "well done". Callum's favourite subject was maths, while his least favourite was reading. Callum's interview revealed that he also knew how to ask for help from the classroom teacher appropriately.

Callum's favourite activities at school were maths games, mobilo (type of lego), and the computers. Callum listed chocolate, computer time, friend time, and virtue vouchers as rewards he would like to receive for good behaviour.

### ***Functional Assessment Hypotheses***

Information gathered from interviews and direct observations hypothesised that Amy engaged in non-compliant behaviour to gain access to negative teacher attention. Callum's

specific hypothesis read “Callum’s engages in off-task behaviour to gain access to peer and/or teacher attention”.

### ***The Motivation Assessment Scale***

**Amy.** The first MAS assessment completed by Amy’s teacher hypothesised that Amy’s target behaviours were maintained by sensory effects. However, the functional assessment disagreed with this hypothesis. In discussion with the teacher about the way the MAS questions were answered it became clear why the MAS hypothesised that Amy’s behaviour was maintained by sensory effects. The first question on the MAS asks “Would the behaviour occur continuously, over and over, if this person was left alone for long periods of time?” Amy’s teacher answered “always”, as he interpreted the question as meaning Amy was alone (seated by herself) in a class full of students. Therefore Amy’s teacher was asked to redo the MAS using the information sheet developed by the researcher (see Appendix 19). The first MAS assessment was unable to be included in the appendix as the teacher threw away the assessment.

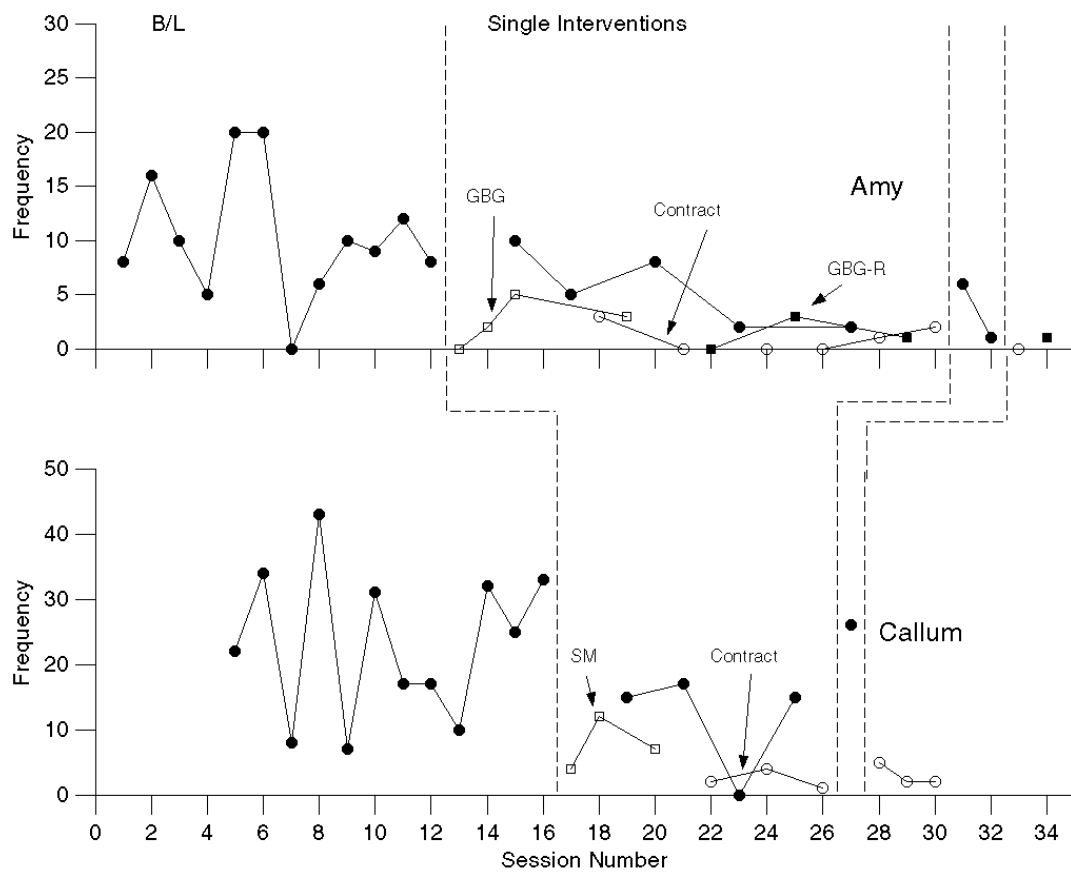
The second MAS assessment (see Appendix 20) hypothesised that the function of Amy’s target behaviours were to gain access to tangible items, with a score of 10. The sensory subscale scored 9, the escape subscale scored 7, and the attention subscale scored 4. Again this hypothesis did not correspond with that produced by the functional assessment. In Amy’s case the hypothesis developed by the functional assessment was used in place of that produced by the MAS.

**Callum.** Information collected from the MAS stated that Callum’s behaviour would “always” occur in response to the classroom teacher talking to other persons in the room, and “always” occurred to get the classroom teacher to spend some time with him (see Appendix 20). The MAS hypothesised that Callum’s behaviour was maintained by attention, showing a total score of 23. The tangible subscale scored 9, sensory subscale scored 8, and the escape subscale was scored as 7. Thus the MAS and the functional assessment produced the same hypotheses.

### ***Baseline and Intervention***

Figure 4 shows that total frequency of behaviours exhibited by Amy and Callum over the baseline and intervention conditions. Once stable baselines were established intervention strategies were introduced, interventions were alternated with baseline conditions, here these alternating baseline conditions are referred to as no intervention.

Amy’s baseline data showed a lot of instability within the first seven sessions before



*Figure 4.* The frequency of each occurrence of all target behaviours plotted against session numbers for Amy and Callum. The filled circles show data from sessions on which there was no intervention, the unfilled squares show data from the first intervention implemented, the unfilled circles show data from the second intervention. For Amy filled squares showed the data from the revised GBG.

becoming more stable in session 8 through to 12. During baseline conditions the occurrence of target behaviours ranged from 0 to 20 per session, with a mean of 10 target behaviours per session.

Callum's baseline data were also very variable during baseline with sessions 2 through to 6 showing large decreases and increases in behaviour. Session 4 had 43 occurrences of off-task behaviour, while in session 5 there were only 7 occurrences of target behaviour. Callum's target behaviours ranged from 7 to 43 per session, with a mean of 22. Amy's data were considered stable before Callum's and therefore Amy's intervention was implemented first.

To examine the functional hypothesis "Amy engages in non-compliance to gain access to negative teacher attention" the GBG was introduced. Results from this intervention showed that when the intervention was first introduced Amy's behaviours were as low as 0, with a mean of 2. However, this decrease did not continue, and in session 16 (GBG) the data were similar to session 17 (no intervention). The introduction of the second intervention, the behavioural contract, saw Amy's target behaviour decrease to as low as 3. The behavioural contract data continued to decrease throughout the alternating treatment sessions to as low as 0 on three occasions, with a mean of 1. The GBG-R showed a larger decrease in non-compliant behaviour than the GBG with a mean of 1. When no interventions were in place in the alternating sessions target behaviours decreased. No intervention during the interventions gave data ranging between 10 and 1, with a mean of 5. During no intervention the data decreased particularly when the GBG-R was introduced.

To examine the functional hypothesis "Callum engages in off-task behaviour to gain access to peer and/or teacher attention" a self management strategy was introduced. Callum's target behaviours decreased compared to those under baseline conditions. Callum's target behaviours ranged from 4 to 15, with a mean of 7. Intervention 2, the introduction of the behavioural contract resulted in a decrease in target behaviour with a mean of 2. The no intervention sessions data also decreased with no target behaviours reported during session 18.

Figure 5 shows the frequency of Amy's target behaviours. Each panel shows a different treatment condition. Off-M-Toy (unfilled squares) was a high rate target behaviour during baseline, however it decreased during no intervention was in place. Non-compliance (x) behaviours were consistently high throughout baseline, but also decreased in the no intervention sessions during the intervention phase. Intervention 1, GBG, gave a decrease in

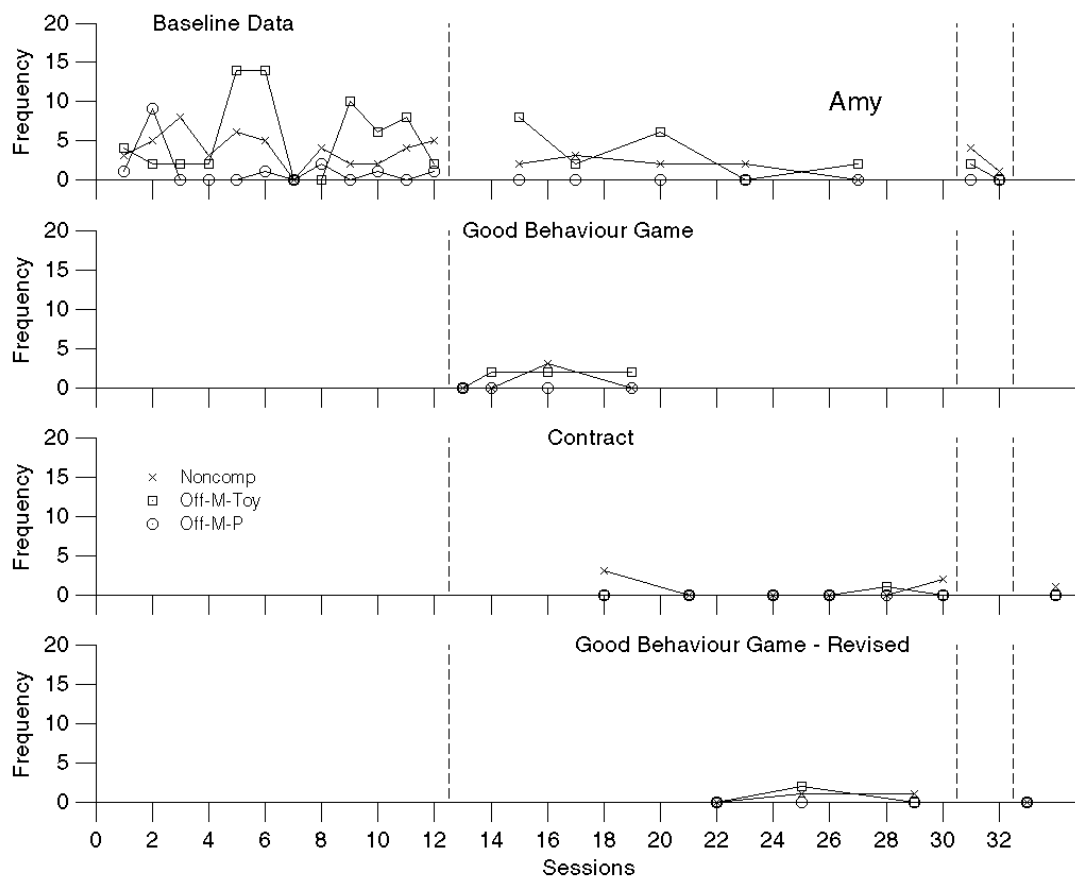


Figure 5. The frequency of each individual occurrence of target behaviour plotted against session numbers for Joel. The top panel shows data when no intervention was in place, the second panel shows data when the GBG was in place, the third panel shows data when the behavioural contract was in place, and the bottom panel shows data for the revised GBG.

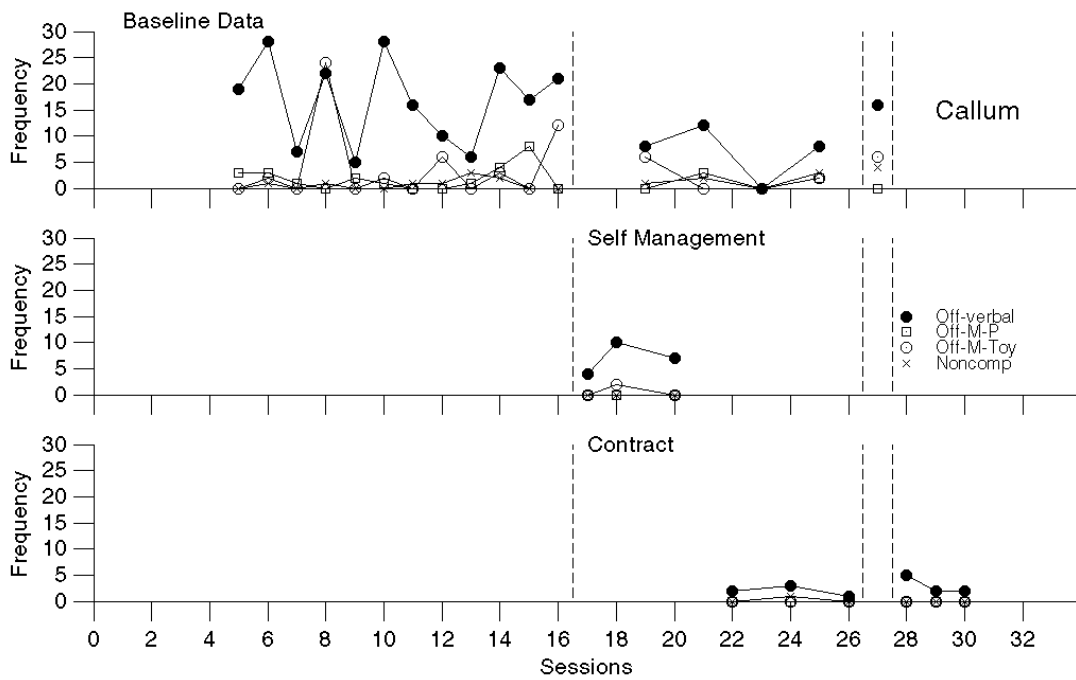


Figure 6. The frequency of each occurrence of target behaviour plotted against session numbers for Callum. The top panel shows data when no intervention was in place, the middle panel shows data when the self-management intervention was in place, and the bottom panel shows data collected during the behavioural contract.

all target behaviours compared to baseline. Revision of the GBG (GBG-R) resulted in fewer than 2 occurrences of target behaviours. During Intervention 2, the behavioural contract, all target behaviours decreased further.

Figure 6 shows the frequency of Callum's target behaviours. Each panel shows a different treatment condition Callum's verbal behaviours (Off-verbal, filled circles) were the highest frequency behaviour, these verbal behaviours were consistently high throughout baseline conditions. When no intervention was in place during the intervention phase, the target verbal behaviours decreased to lower than the initial baseline. Off-M-Toy (unfilled circles), and Off-M-P (unfilled squares) were observed to occur throughout baseline and when no intervention was in place, however these behaviours were at a low rate compared to the target verbal behaviours. Figure 6 shows that when the self-management intervention was introduced target verbal behaviours decreased to levels lower than during the initial baseline conditions. However, the behavioural contract saw the greatest decrease in target verbal behaviours.

### ***Inter-observer Reliability***

Inter-observer observations were conducted across 23.5% of sessions for Amy, inter-rater reliability was calculated at 91.6%. Inter-observer observations were conducted across 23% of sessions for Callum, inter-rater reliability was calculated at 91.1%.

### ***Treatment Acceptability***

The GBG received a total acceptability score of 72 out of a possible 90 from Amy's teacher aide. She "strongly agree[d]" that the "intervention did not result in negative side-effects for the student". Amy's teacher gave a total acceptability score of 85/90. Amy's teacher "strongly agree[d]" that the GBG required little technical skill, it required little training to implement effectively, and found the intervention easy to implement in a classroom with 30 other students. The behavioural contract received a total acceptability score of 75 out of 90 from Amy's teacher aide. Amy's teacher gave an acceptability score of 90/90 for the behavioural contract. He commented that the behavioural contract "worked well with [the] pre-existing behaviour management programme". Callum's teacher gave a total acceptability score of 48/90 for the self management intervention. She commented that it "took several discussions [with the researcher] before [she] could understand and could implement [the] system". She also noted that the self management intervention would better suit "student's who [could] take responsibility without [teacher] support". The behavioural contract received an acceptability score of 83/90. Callum's teacher stated that "[it] was a very

powerful intervention [that required] little effort". She also noted that she had suggested the use of the intervention to several other teachers within the school.

Amy gave a total acceptability rating of 41/42 for the GBG and a rating of 42/42 for the behavioural contract. Callum gave the self management intervention an acceptability rating of 32/42, and an acceptability rating of 42/42 for the behavioural contract. Callum commented that he liked the behavioural contract better than self management as "it was easier".

## Discussion

This experiment compared the normal functional assessment process with the MAS, because as, Sigafos et al. (1994) reported, the MAS appeared to be a more efficient and practical method of assessment for teachers. The data show that the MAS provided a valid hypothesis for only one student, when compared to the results of the functional assessment. Amy's target behaviours were hypothesised by the MAS to be maintaining both sensory and tangible effects, while the functional assessment hypothesis was attention. Here the functional assessment hypotheses were used in place of the MAS. This supports the findings of Sigafos et al. (1994) who also noted that the MAS may not always represent a reliable method for identifying behavioural function. One possible reason that the MAS did not effectively identify behavioural function here could be due to the fact it was designed to assess the variables maintaining an individual's self-injurious behaviour, and for those with an intellectual disability (Durand & Crimmins, 1988). Teachers misinterpreted several questions on the MAS, specifically question 1 (see Experiment 2 MAS results), possibly because they were relating the question to students without an intellectual impairment. The development of an information sheet by the researcher was used to clarify question 1 for the class teachers, however, even with the inclusion of the information sheet only one MAS result agreed with the full functional assessment. Many questionnaires are available for the use with assessing the functions of behaviour for ADHD populations, however, these can be time consuming. For example Hoff et al. (2005) used the Functional Assessment Interview described by O'Neill et al. (1997), this interview requires the teacher to observe and collect data on target behaviours across different situations and time frames. Thus, this interview is time consuming and is only comprises part of the descriptive assessment used in functional assessment. That is needed for teachers is an efficient questionnaire, thus a questionnaire similar to the MAS, available on the internet free, and easy to complete without the help of a professional, needs to be developed to assess behavioural function within ADHD populations.

As in Experiment 1 the teachers successfully implemented the selected interventions within a mainstream classroom and the interventions were found to decrease target behaviours. In Experiment 1 the more successful intervention, the token economy, was less accepted by the classroom teachers because of the time and effort it took to implement within the classroom environment. In Experiment 2 interventions were planned to be less time

consuming for teachers while still providing an effective intervention that would decrease target behaviours. Interventions involving self-management and self-reinforcement were discussed in relation to the hypotheses derived from the functional assessment. Callum's self-management intervention required him to record instances of target behaviours, here the researcher trained the student, and the teacher administered reinforcement at the end of the session if the target had been met. This intervention however did not effectively reduce target behaviours. Callum found the self-management hard to manage by himself, and often did not record occurrences of the target behaviour. The self-management intervention also proved to be more of a distraction than an intervention tool at times, Callum would flick his card against his pen, thus disrupting class instruction. Callum's teacher also noted that the self-management intervention would better suit students who could manage their own behaviours effectively. Therefore, the behavioural contract was a more effective intervention in its ease and implementation, while also effectively decreasing target behaviours. The GBG involved a form of self delivery of smiley faces under the teacher's instruction. However during the first two sessions of the GBG the researcher had to keep instructing the teacher to reinforce appropriate behaviours. This intervention did require some revision, as the rate of tangible reinforcement was not high enough to produce significant changes in target behaviours. The GBG-R resulted in a significant decrease in target behaviours. The GBG intervention was effective in reducing target behaviours, thus supporting the literature on token economies (e.g., Gureasko-Moore et al., 2006). Behavioural contracts were implemented for each student, this intervention required little effort from the classroom teacher once the contracts were established. The behavioural contracts were successful in decreasing target behaviours for both students. The behavioural contracts were also the most accepted intervention, by both the teachers, and the students. In Experiment 1 the students and teachers selected different interventions as being acceptable. These results suggest that behavioural contracts can be implemented effectively with ADHD students in their usual classroom effectively.

Social acceptability questionnaires were completed by both the students and the teachers to assess the acceptability of each intervention. Callum and his teacher both gave the self-management intervention low acceptability scores. This intervention was however shown to be less effective at decreasing target behaviour when compared to the behavioural contract. All the teachers rated the behavioural contract as being the most acceptable intervention, this was also the most effective intervention at decreasing target behaviours. These results were not observed in Experiment 1, there teachers rated the least effective intervention as

acceptable. Amy's teacher and her teacher aide rated both interventions highly, however the behavioural contract received somewhat higher ratings than the GBG. These higher acceptability ratings in Experiment 2 could have been due to the behavioural interventions being less time consuming.

In contrast to Experiment 1, target behaviours decreased in the 'no intervention' sessions (during the intervention phase) compared to the initial baseline suggesting that the effects of the interventions generalised to the usual classroom routine. This was most evident with Amy's data, here the no intervention sessions data decreased to levels similar to those with the interventions in place. This would suggest that the interventions implemented in Experiment 2 were more useful than those implemented in Experiment 1 as they reduced target behaviours when no interventions were in place.

## General Discussion

The results of the investigations described here provides support for the use of functional assessment within a larger classroom with an ADHD population, with the class teacher playing an active role in the functional assessment process and the subsequent interventions. Information gathered from multiple sources during the descriptive assessment led to the collaborate development of hypotheses that were testable in a mainstream classroom. These hypotheses led to the implementation of selected behavioural interventions. Here it was shown that the token economy, the behavioural contracts and the GBG were effective interventions that successfully decreased target behaviours within the classroom.

The findings in this study also provided additional support for the application of functional assessment procedures with ADHD students. Functional assessment procedures successfully assessed behavioural function of target behaviours for all four students. This investigation contributes to the limited research on the use of functional assessment with ADHD students conducted in mainstream schools (e.g., Hanley et al., 2003; Ervin et al., 2001).

As discussed earlier, functional assessment is a lengthy process (Sigafos et al., 1994), thus, the MAS was tested in Experiment 2 to see if it would provide a more “teacher friendly” assessment. The MAS has the potential to provide a quick and easy assessment to class teachers. Experiment 2 found that while the MAS was easy to implement and free to access, it was not successful in assessing behavioural function for one of the students. Therefore, these results suggest that the MAS may not be an appropriate tool to evaluate behavioural functions with an ADHD population. Future research could focus on developing a questionnaire similar to the MAS that focuses on students with a normal intellectual ability, as the MAS focuses in self-injurious behaviour (Durand & Crimmins, 1988). This seems important if the method is to be accepted by class teachers for use within a mainstream classroom.

Results of the functional assessment allowed the development and implementation of classroom interventions. As Experiment 1 and 2 reported some interventions were more successful than others at decreasing target behaviours. Experiment 1 found the token economy to decrease target behaviours more effectively than that of the peer support, and seating interventions. Experiment 2 reported that the self-management intervention used with Callum, was not effective in decreasing target behaviours, however the other interventions

were. Thus, functional assessment was successful in the development of successful classroom interventions for the use in decreasing target behaviours with ADHD children.

Acceptability questionnaires were used to assess the acceptability of the functional assessment and subsequent interventions. Such questionnaires allowed the researcher to see which interventions were socially accepted by the class teacher and the students. The results of these questionnaires are important as they showed that while the token economies in Experiment 1 were successful in decreasing target behaviours they were less accepted by the class teachers, thus the interventions were rated acceptable due to the ease of implementation rather than the effect they had on target behaviours.

To conclude, functional assessment procedures were effective in developing hypotheses that led to successful intervention strategies that were implemented by the classroom teachers with an ADHD population. This provides support for the use of dynamic assessments as described by Goldiamond (1965), or now more commonly known as functional assessment.

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## Appendix 1

### Research Proposal

Attention Deficit Hyperactivity Disorder (ADHD) is characterised by inattention, disorganisation, restlessness, impulsivity, and hyperactivity (Kronenberger & Meyer, 2001). These behaviours result in higher than average rates of off-task behaviour in classroom settings, thereby compromising the children's performance on independent assignments, in group discussions, and in attending to teacher instruction (DuPaul, Ervin, Hook, & McGoey, 1998).

Target behaviours, such as off-task behaviour, present difficulties for classroom teachers. Teachers are confronted with the daily task of trying to develop accommodations and interventions to meet the academic and social needs of children with behaviour problems. However, many schools do not possess the resources or the knowledge to decrease, constructively, target behaviours associated with ADHD in the classroom (Boyajian et al., 2001).

Functional assessment has emerged in the literature as being a useful method for identifying environmental events that maintain problem behaviour (Boyajian et al. 2001). Functional assessment attributes the problem behaviours to the environment rather than identifying the individual as being the problem (Church, 2005). An important contribution of functional assessment has been the development of highly specific and effective interventions that directly address the function or functions that maintain problem behaviour (Piazza et al., 2003)

What is a functional assessment? Functional assessment is a useful method for identifying environmental events that maintain problem behaviours (Boyajian et al., 2001). Functional assessment enables us to accomplish three goals: (a) analyse and modify classroom events to prevent inappropriate behaviour from occurring in the future; (b) determine the outcome, or function, an inappropriate behaviour serves so that it can be replaced with an appropriate behaviour that serves a similar function, and (c) develop interventions to enable children to exhibit desirable classroom behaviours (Reid & Maag, 1998).

Functional assessment allows for the development of individualised treatment interventions. For example; Jimmy and Sam are in the same class and are displaying similar target behaviours. These include: off-task behaviour, interrupting class mates, not working well in groups, and not attending to teacher instruction. Although the behaviours appear the same the functions that these behaviours serve for Jimmy and Sam may be very different. Class observations and a functional assessment reveal that Jimmy's behaviours are maintained by attention, while Sam's behaviours are maintained by escape from task demands. Without a functional assessment the wrong intervention may have been implemented thereby reinforcing problem behaviours. Consider, for example, if both of the children's behaviours are hypothesised to be maintained by attention and the teacher decides to use time-out as the intervention, so that each time a problem behaviour is exhibited the child is removed from the situation and the consequent attention. This intervention might be expected to work for Jimmy; however Sam's behaviours may merely be negatively reinforced by allowing him to escape from difficult tasks and/or social situations.

What does a functional assessment involve? During the first phase of a functional assessment, the problem behaviour is operationally defined. Next a descriptive analysis is conducted. In this potential antecedents (stimuli that precede and trigger behaviour) and

consequences (events that occur after a behaviour and serve to strengthen and maintain behaviour) related to target behaviours are identified through interviews with teachers, parents, and children. In addition direct observations of behaviour(s) and environmental variables are conducted. Here the ABC's (antecedents, behaviour, and consequences) are actually observed and recorded. An antecedent is any event or stimulus that occurs before a behaviour occurs, while the consequence is any event or stimulus that occurs after a behaviour (Watson & Steege, 2003). The goal of this stage is to develop hypotheses regarding the function(s) of the target behaviour(s) by identifying variables that set the occasion for (antecedent) and/or maintain (consequence) target behaviour (DuPaul & Ervin, 1996). The experimental analysis stage of functional assessment involves the systematic manipulation of antecedent and/or consequent events to directly test the hypothesis derived from the descriptive analysis

The majority of functional assessment studies to date have focused on developmentally delayed subjects in contrived settings (Lewis & Sugai, 1996). For example, McCord, Iwata, Galensky, Ellingson, and Thomson (2001) used controlled conditions to expose seven adults with developmental disabilities to a series of noises. They examined the effects of noise on those behaviours using a room equipped with a one way observation window and sound amplifiers. McCord et al. (2001) conducted a four-part investigation to develop methods for assessing and treating problem behaviour evoked by noise.

In Phase 1, and prior to conducting a functional assessment the participants were exposed to a series of noises to identify the most relevant noises for inclusion in the study. This stage also served to phase out participants who did not exhibit problem behaviour in response to the noises tested. Results showed that 5 of the participants did not display problem behaviours in response to the noises and they were excluded from the remainder of the study. Results suggested that specific noises (telephone ringing, fire alarm, and screaming) may have functioned as establishing operations (EOs) for two of the participants.

Phase 2 assessed whether similar rates of problem behaviour would be observed in the absence of noise. This was achieved by exposing participants to three conditions (noise, play, and no interaction) arranged in a multi-element design. Results indicated that both participants engaged in little or no problem behaviours during the play and no interaction conditions but consistently engaged in either high or moderate levels of problem behaviour when noise was present as an antecedent event and was terminated as a consequence. This indicating that the participants behaviour was maintained by escape from noise (negative reinforcement).

In Phase 3, preference assessments were conducted to identify potential reinforcers that might be used in conjunction with treatment programs. Six or seven edible items were selected based on interviews with staff. Debbie's assessment entailed a multiple-stimulus presentation. A paired stimulus procedure was used for Sarah. Results showed that Debbie had a strong preference for Milky Way, selecting it first during every session, while Sarah showed a preference for cheese puffs.

In Phase 4, McCord et al's. (2001) approach to treatment was to increase tolerance to noise rather than on establishing appropriate escape behaviour which was achieved by extinction. Noise was decreased then gradually increased using stimulus fading procedures. During the course of Sarah's treatment it was noted that the stimulus fading procedure was unsuccessful in reaching the end of treatment criterion. Sarah's treatment was supplemented by differential reinforcement (DRO) by reinforcing tolerance of noise, thus facilitating treatment effects. Intervention resulted in elimination of problem behaviour at noise levels that both participants previously found intolerable.

This study highlighted the importance of functional assessment in developing individualised treatment interventions. McCord et al. (2001) showed that sometimes it is necessary to conduct functional assessment in a contrived setting as the conditions used would have been very hard to monitor in a real-life settings.

To the author's knowledge there are only three studies that assess the use of functional assessment in real-life classrooms and these studies also highlight the effectiveness of functional assessment.

Ervin, DuPaul, Kern, and Friman (1998) evaluated the utility of classroom based functional assessments of problems behaviours for two adolescents, Carl and Joey, who met criteria for ADHD and comorbid Oppositional Defiant Disorder (ODD). The study was conducted at Girl's and Boy's Town, where there was already a comprehensive token economy in place in the classroom. A token economy is based on a motivational system where points are exchanged for daily privileges contingent on appropriate behaviours. Behaviours exhibited by both boys were off-task behaviours (i.e., talking out, gesturing, talking to peers, playing with objects, and making funny faces).

It was hypothesised that Joey's off-task behaviours might be maintained by escape from paper and pencil writing tasks. An intervention was developed for Joey that provided him with a computer as an alternative writing method during long writing tasks. The first hypothesis stated that "Joey's on-task behaviour will be increased when he is given the opportunity to complete long (20 min) writing tasks on the computer rather than by hand" (p. 70). A second hypothesis was developed to address problem behaviours during the short journal-writing activity. The second hypothesis stated that "Joey's on-task behaviour will be increased when he is able to brainstorm with a peer prior to a short (5-7 min) written task" (p.70). Both hypotheses were tested during the same week in writing class.

Descriptive assessment information suggested that Carl's disruptions might be maintained by peer attention. The first hypothesis stated "Carl's on-task behaviour will increase when he is instructed to self-evaluate his peer attention-seeking behaviours and is awarded points for accuracy and low levels of problem behaviours" (p.71). This hypothesis was tested by asking Carl to rate his appropriate behaviour on a scale of 0 (unacceptable) to 5 (excellent). The second hypothesis stated "Carl's on-task behaviour will increase when he does not receive social reinforcers from his peers for his behaviour" (p.71).

Hypotheses generated in the descriptive analysis were tested through teacher manipulations using a brief reversal design. Baseline conditions were alternated within conditions hypothesised to produce low levels of problem behaviour. The percentage of intervals in which Joey was on task during long writing tasks was higher when he used a computer than when he wrote by hand. Similarly, the percentage of intervals with on-task behaviours was higher when he brainstormed with a peer prior to journal writing than when no brainstorming occurred. The percentage of intervals that Carl was observed to be on-task was higher when he self-evaluated his peer-seeking behaviours than when he did not self-evaluate. In addition the percentage of intervals with on-task behaviour was higher when Carl's peers received consequences for responding to his attention seeking behaviour than when peers were not given consequences. The teacher and consultant jointly selected intervention components to implement on an ongoing basis. Interventions resulted in improvements of the students' behaviour; supporting the utility of school based functional assessments.

Hoff, Ervin, and Friman (2005) conducted a functional assessment of disruptive behaviours in a general education classroom at Girl's and Boy's Town which again used an existing token economy. The participant was a 12-year-old boy diagnosed with ADHD and ODD. Hypothesis development involved individual interviews with the classroom teacher

and direct observations of target behaviour. Data were collected to determine the occurrence and non-occurrence of disruptive behaviour, as well as the antecedents and consequences surrounding that behaviour. Information gathered during hypothesis development pointed to two possible functions of disruptive behaviour; access to peer attention, and escape from non-preferred tasks. Interventions were developed and implemented based on hypotheses. The first hypothesis was that Kevin engaged in disruptive behaviour to gain access to peer attention. The second hypothesis was that Kevin engaged in disruptive behaviour to escape/avoid a non-preferred task. A third hypothesis was considered that addressed multiple functions of Kevin's disruptive behaviour. Once a stable baseline (conducted twice using the usual classroom routine) had been established interventions were introduced. Interventions were developed to examine the effects of having more preferred peers close, more preferred reading materials, and the combined effects of both peer proximity and preferred reading materials. Interventions included; preferred peer close versus far, more versus less preferred reading materials, and a combination of preferred peers far and more preferred reading materials. Results indicated that the interventions were successful in decreasing disruptive behaviour, and social acceptability for the assessment and intervention was high.

Both Ervin et al. (1998) and Hoff et al. (2005) showed the effectiveness of functional assessment in classrooms; however both were conducted in a classroom which had systematically applied a token economy. The token economy may limit the generality of the effects of specific intervention strategies to other settings and students.

Lewis and Sugai (1996) carried out a study on the use of functional assessment with non-disabled, at-risk, children in general education settings using three participants. Participant One (Fred) was a 7-year-old male who exhibited high rates of off-task behaviour, and non-compliance with teacher directions. Results from ABC (antecedent, behaviour, consequence) observations indicated that peer and/or teacher social attention were highly probable after Fred's displays of inappropriate behaviours, suggesting these were maintaining factors for Fred's inappropriate behaviours. Analogue (set up) functional analyses were conducted to assess Fred's on- and off-task behaviour. Three testing sessions during a one hour reading period were implemented in a simultaneous treatment design and Condition 1 consisted of high peer attention plus low teacher attention (HPLT), condition 2 consisted of low peer attention plus low teacher attention (LPLT). During the third condition, Fred received high peer attention plus high teacher attention (HPHT). This was achieved by placing Fred in a group of the high peer attention peers, while teacher attention was increased to a fixed interval 30 second schedule (FR30) by verbally issuing a redirect or verbal praise statement.

Participant 2 (Jack) was a 9 year-old boy who exhibited high rates of off-task behaviour, inappropriate social interactions, and socially withdrawn behaviour. Participant 3 (Sal) was a 9-year-old male identified as ADHD. Preliminary observations indicated that Jack engaged in off-task and socially withdrawn behaviours during independent work activities, while Sal's inappropriate behaviours seemed to be maintained by teacher and peer attention. For Jack a functional assessment was developed to assess the effects of independent versus small group tasks, peer attention, and teacher attention on behaviour. A similar functional assessment was developed for Sal, to assess the effects of peer and teacher attention.

Functional assessment results confirmed the preliminary hypotheses that Jack's off-task behaviour functioned to gain peer attention. It also confirmed that Sal's displays of problem behaviour resulted in teacher and peer attention. However, Lewis and Sugai (1996) did not implement any intervention. Thus, results from that study provide evidence showing it is possible to conduct a functional assessment within a mainstream classroom but it does not show whether it is possible to implement intervention.

I plan to partially replicate the study conducted by Hoff, Ervin, and Friman (2005). This study will look at whether it is feasible to conduct and implement a functional assessment in a general education setting within a New Zealand classroom with the teacher implementing an intervention, developed from the information gained from the functional assessment. Social validation questionnaires will be developed to determine the acceptability of the assessment and the following intervention with all those involved in the process.

### **Participant recruitment**

Participants will be recruited through the recommendations of psychologists, the school principal, and teachers.

- (1) Approach principal/s of a primary school.
- (2) If principal/s agrees to meet ask him/her to identify 3 or 4 potential participants. Participants will be required to have either a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD), or have meet the criteria for ADHD, for example: attention problems, overactivity (restlessness, inability to sit still, fidgeting, and constant movement), impulsivity (interrupting others, difficulty waiting for turn, blurting out answers, making simple mistakes because of impulsive answers, and acting without considering consequences), organisational deficits (problems staying on schedule, messiness, slow completing tasks, and often off-task), poor school performance and/or learning disability, peer relationship problems, and negative interactions and relationships with authorities (Kronenberger & Meyer, 2001).
- (3) Approach the teacher/s of the children the principal has identified with information about the study. Teachers will receive letters containing information about the study, why the study is being conducted, examples of interventions that have been used in classrooms to reduce target behaviours, and how important their input and knowledge will be to the success of program development and intervention.
- (4) If teacher/s are prepared to co-operate, the school is then asked to send an information/consent form to the parents/guardians of the participants identified by the principal. Parents and/or legal guardians of the children directly involved in the study will be sent a letter informing them of the functional assessment process, providing them with a time frame, the right to withdraw at any point, and what the study hopes to accomplish.
- (5) Once informed consent is received from all parties we can start the study.

### **Procedure**

- Ethical approval.
- Receive consent from parents.
- Discussion of target behaviour with school personnel in contact with child (teacher).
- Casual observation in classroom to refine an operational definition of target behaviour in discussion with classroom teacher. Possibility of developing tentative hypotheses.
- Decide on appropriate observation system depending on the behaviours observed, possibility of using partial interval recording if target behaviours have a high frequency.
- Discuss times and places when target behaviour occurs and when it does not occur.
- Select method of recording.
- Decide on how many observations will be recorded in order to obtain a high level of inter-observer reliability.
- Observe.

- Record ABC's (antecedents, behaviour, and consequences).
- Discuss tentative hypotheses with classroom teacher. Once hypotheses are developed the specific variables that have been hypothesised to be related to the target behaviour/s will be systematically manipulated. Behaviour will be monitored while manipulating the environmental variables hypothesised to be related to the target behaviours.
- Decide on treatment design. Single-subject design seems appropriate for the intervention, as subjects will require ongoing monitoring of behaviour. In the Multiple Baseline across subjects design one target behaviour is selected for two or more subjects in the same setting. After steady state responding has been achieved under baseline conditions, the independent variable is applied to one of the subjects while baseline conditions remain in effect for the other subjects. When stable responding has been attained for the first subject, the independent variable is applied to the second subject, and so on (Cooper, Heron, & Heward, 1987).

This study will take place in a general education classroom in a primary school in the Hamilton area. Once our ethics proposal has been approved the functional assessment will start. The first strategy for conducting this functional assessment will be to talk to the people who have direct contact and knowledge of the individual/s. The aim of this procedure is to identify which events seem to be linked to the specific problem behaviours and which are not.

The second strategy for collecting information for the functional assessment is to observe the individual/s behaviours during their typical daily routines. Here we will want to focus on the ABC's of the behaviour, (a) the antecedents or what happened before the target behaviour occurred, (b) the behaviour, and (c) the consequences that resulted from the behaviour. ABC's will be recorded on a behavioural observation form. During this process in which we will want to ask questions such as; what problem behaviours happen together? , When, where, and with whom are the problem behaviours most likely? , What consequences appear to maintain occurrence of the problem behaviour? These questions will help develop tentative hypotheses about what may be maintaining the target behaviour/s. Using the information gathered hypotheses and intervention strategies will be developed in collaboration with the classroom teacher. These strategies will then be implemented within the classroom in the form of an intervention that best suits the participant and the classroom routine. Upon completion of the intervention, the functional assessment process and the intervention itself will be evaluated in terms of acceptability.

### **Social validation questionnaire (treatment evaluation)**

Consumer satisfaction questionnaires will be administered to the teachers and students at the conclusion of the study to assess their perceptions of the acceptability, feasibility, and perceived effectiveness of the functional assessment process and subsequent intervention. The classroom teacher will be asked to complete the Intervention Rating Profile-20 (IRP-20; Witt & Martens, 1983). This questionnaire consists of 20 items rated on a Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree). Each of the items will be reworded slightly so that the teacher is rating the acceptability of the functional assessment process and the subsequent intervention. Children will be asked to complete the Children's Intervention Rating Profile (Witt & Elliott, 1985). The Children's Intervention rating scale is a 7-point Likert scale. A rating of 1 indicates that the subjects do not agree with the given statement, and a rating of 6 will indicate that subjects agreed with the statement. In addition to the questionnaires, brief interviews will be conducted to obtain information about preferences and suggestions for future assessment and treatment evaluation.

## Appendix 2

### School cover letter

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The University of Waikato

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Hamilton,

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New Zealand



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

Thank you for considering participating in this research project which I am undertaking towards my Masters degree.

I have now gained ethical approval and can proceed further with the study. I have enclosed a copy of the research proposal which was presented to the ethics committee, a copy of the information sheet that will be provided for the teachers directly involved, and the information sheets that will be provided to parents requesting consent.

I would appreciate it if you could let me know as soon as possible if your School can participate. I have high hopes that your team and the children involved will benefit from this study.

If you agree we can proceed. The next step is probably for me to give information on the study to teachers who may be involved.

Please feel free to contact me or my supervisors at any time throughout this research project.

## Appendix 3

### Teachers Information Sheet

My name is Emerald Brierly and I am a student at the University of Waikato currently doing my Masters of Applied Psychology. As part of this program I am required to submit a research project. My thesis will look at functional assessment within a general education classroom.

Attention Deficit Hyperactivity Disorder (ADHD) is characterised by inattention, disorganisation, restlessness, impulsivity, and hyperactivity (Kronenberger & Meyer, 2001). These behaviours result in higher than average rates of off-task behaviour in classroom settings, thereby compromising the child's performance on independent assignments, in group discussions, and in attending to teacher instruction (DuPaul, Ervin, Hook, & McGoey, 1998).

Target behaviours, such as off-task behaviour, present difficulties for classroom teachers. Teachers are confronted with the daily task of trying to develop accommodations and interventions to meet the academic and social needs of children with behaviour problems. However many schools do not possess the resources or the knowledge to decrease, constructively, target behaviours in the classroom (Boyajian et al., 2001).

Functional assessment has emerged in the literature as being a useful method for identifying the environmental events that maintain an individual's problem behaviour (Boyajian et al. 2001). Functional assessment attributes problem behaviours to the environment rather than identifying the individual as being the problem (Church, 2005).

What is a functional assessment? Functional assessment is a useful method for identifying environmental events that maintain problem behaviours (Boyajian et al., 2001). Functional assessment enables us to accomplish two goals: (a) determine the outcome, or function, an inappropriate behaviour serves so that it can be replaced with an appropriate behaviour that has a similar function, and (b) develop interventions to enable children to exhibit desirable classroom behaviours (Reid & Maag, 1998).

Functional assessment is important in that it determines the function (e.g. attention, escape, and tangible) that the behaviour is maintaining for the individual. If the function of the behaviour is not determined then you are unable to develop an appropriate intervention. Functional assessment allows for the development of individualised treatment interventions. For example; Jimmy and Sam are in the same class and are displaying similar target behaviours. These include: off-task behaviour, interrupting class mates, not working well in groups, and not attending to teacher instruction. Although the behaviours appear the same the functions that these behaviours serve for Jimmy and Sam may be very different. Class observations and a functional assessment reveal that Jimmy's behaviours are maintained by attention, while Sam's behaviours are maintained by escape from task demands. Without a functional assessment the wrong intervention may have been implemented thereby reinforcing problem behaviours. Consider, for example, if both of the children's behaviours are hypothesised to be maintained by attention and the teacher decides to use time-out as the intervention, so that each time a problem behaviour is exhibited the child is removed from the situation and the consequent attention. This intervention might be expected to work for Jimmy; however Sam's behaviours may merely be negatively reinforced by allowing him to escape from difficult tasks and/or social situations.

Functional assessment has been successful with target behaviours associated with ADHD in the classroom with professionals (e.g., McCord et al., 2001 and Piazza et al., 2005). Those few studies that have conducted functional assessments within 'real' classrooms

had small class sizes, and employed token economies (motivational system where points are exchanged for daily privileges) thus it is unclear whether small class size complemented the success of the assessment, the token economy, or both (e.g., Hoff, Ervin, & Friman, 2005. and Ervin, DuPaul, Kern, & Friman, 1998). The one study that did implement a functional assessment within a naturally occurring classroom did not provide behavioural interventions, thus they showed that it is possible to conduct a functional assessment within a mainstream classroom, but were unable to show whether it was possible to conduct a functional assessment and consequent behavioural intervention (e.g., Lewis & Sugai 1996).

Can a functional assessment be done in a regular classroom with ADHD children using non-professionals? That is what I want to find out. This study will look at functional assessment of target behaviours with a population of ADHD children within a mainstream New Zealand classroom.

Teachers your help and assistance will be greatly appreciated with:

- Identifying participants. The study requires 2-5 participants. The children required for this study will have behaviours characteristic of those with a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) but will not necessarily have the diagnosis. Thus they will have, to a degree that is disruptive and inappropriate, six or more of the following:
  1. Often does not give close attention to details or makes careless mistakes in schoolwork, work, or other activities.
  2. Often has trouble keeping attention on tasks or play activities.
  3. Often does not seem to listen when spoken to directly.
  4. Often does not follow instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions).
  5. Often has trouble organizing activities.
  6. Often avoids, dislikes, or doesn't want to do things that take a lot of mental effort for a long period of time (such as schoolwork or homework).
  7. Often loses things needed for tasks and activities (e.g. toys, school assignments, pencils, books, or tools).
  8. Is often easily distracted.
  9. Is often forgetful in daily activities.

Or six or more of the following:

1. Often fidgets with hands or feet or squirms in seat.
2. Often gets up from seat when remaining in seat is expected.
3. Often runs about or climbs when and where it is not appropriate (adolescents or adults may feel very restless).
4. Often has trouble playing or enjoying leisure activities quietly.
5. Is often "on the go" or often acts as if "driven by a motor".
6. Often talks excessively.
7. Often blurts out answers before questions have been finished.
8. Often has trouble waiting one's turn.
9. Often interrupts or intrudes on others (e.g., butts into conversations or games).

Or six or more from BOTH lists. Based on the American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. Washington, DC, American Psychiatric Association, 2000.

- Helping decide on target behaviours to be observed.
- Teachers will not be expected to record observation data at any point in the study; this will be conducted purely by the researcher.
- Meet to discuss preliminary hypotheses maintaining target behaviour.
- Meet to discuss observations.
- Collaborate together to decide on an appropriate classroom intervention.
- Implement classroom intervention (see examples from the literature).
- Researcher will observe throughout.

Your classroom routine will not be required to change as this study looks at functional assessment within a naturally occurring classroom. Your support with this study would be significant to its success. Please note that you are able to withdraw your participation from this study at any point without incurring penalties.

Examples of intervention strategies that have been used in studies include:

Escape from paper and pencil writing tasks (Ervin, DuPaul, Kern, & Friman, 1998).

- (a) Providing an alternative means for accomplishing the writing tasks.
- (b) Giving the child extra time to think about what they have to write prior to the writing activity.
- (c) Allowing brief breaks from writing tasks contingent on an appropriate request.

Disruptions maintained by peer attention (Ervin et al., 1998).

- (a) Reducing access to peer attention (e.g., separation, reducing peer responsiveness by providing consequences to peers).
- (b) Providing contingencies for appropriate behaviour that is incompatible with peer attention-seeking behaviour (e.g., Self-monitoring of on-task behaviour).
- (c) Structuring the classroom so that the child would be less likely to engage in attention-seeking behaviour (e.g., Place child in close proximity to the teacher and provide prompts to stay on task and not to disrupt peers).
- (d) Providing more consistent and frequent reinforcement (i.e., praise, points) for on-task behaviour and punishers (i.e., negative points, verbal reprimands) for disrupting peers.

Your time and cooperation in this study would be greatly appreciated. If you have any questions please do not hesitate to contact either myself or my supervisors.

## Appendix 4

### Parent Information Sheet

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The University of Waikato      Ext 8400  
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Hamilton,      [www.psychology.waikato.ac.nz](http://www.psychology.waikato.ac.nz)  
New Zealand



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

I am a student at the University of Waikato currently doing my Masters of Applied Psychology. As part of this program I am required to submit a research project. My thesis will look at functional assessment within a general education classroom.

Behaviours, such as off-task behaviour, present difficulties for classroom teachers. Teachers are confronted with the daily task of trying to develop accommodations and interventions to meet the academic and social needs of children with such off-task behaviours. However many schools do not possess the resources or the knowledge to decrease, constructively, behaviours in the classroom (Boyajian et al., 2001).

Functional assessment has emerged in the literature as being a useful method for identifying the environmental events that maintain an individual's off-task behaviour (Boyajian et al. 2001). Functional assessment attributes off-task behaviours to the environment rather than identifying the individual as being the problem (Church, 2005).

Functional assessment is important in that it determines the function (e.g. attention, escape, and tangible) that the behaviour is maintaining for the individual. If the function of the behaviour is not determined then you are unable to develop an appropriate intervention. Functional assessment allows for the development of individualised treatment interventions. For example; Jimmy and Sam are in the same class and are displaying similar target behaviours. These include: off-task behaviour, interrupting class mates, not working well in groups, and not attending to teacher instruction. Although the behaviours appear the same the functions that these behaviours serve for Jimmy and Sam may be very different. Class observations and a functional assessment reveal that Jimmy's behaviours are maintained by attention, while Sam's behaviours are maintained by escape from task demands. Without a functional assessment the wrong intervention may have been implemented thereby reinforcing problem behaviours. Consider, for example, if both of the children's behaviours are hypothesised to be maintained by attention and the teacher decides that each time a problem behaviour is exhibited the child is removed from the situation and thus from the consequent attention. This intervention might be expected to work for Jimmy; however, Sam's behaviours may be increased as this allows him to escape from difficult tasks and/or social situations.

My thesis looks at whether it is possible for a functional assessment to reduce off-task behaviours in a usual classroom.

This study will involve observing off-task behaviours in the classroom and developing interventions to reduce these behaviours. Observations will be conducted in order to determine initial target behaviours. All observations will be conducted during regular classroom routine, with the class teacher present throughout the study. The names of those participating will not be used in any reports so that they remain anonymous.

If you choose to let your child participate you have the right to withdraw them from the study at any point. At the end of the study it would be my pleasure to provide you with an executive summary containing the results and a summary of the study.

**Appendix 5**

**CONSENT FORM**  
University of Waikato  
Psychology Department  
**CONSENT FORM**

**PARTICIPANT'S COPY**

Research Project: Functional Assessment of Off-task Behaviours

Name of Researcher:

Name of Supervisor (if applicable):

I have received an information sheet about this research project or the researcher has explained the study to me. I have had the chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Research and Ethics Committee.

Participant's Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

=====  
University of Waikato  
Psychology Department  
**CONSENT FORM**

**RESEARCHER'S COPY**

Research Project: Research Project: Functional Assessment of Off-task Behaviours

Name of Researcher:

Name of Supervisor (if applicable):

I have received an information sheet about this research project or the researcher has explained the study to me. I have had the chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to participate in this research project and I understand that I may withdraw at any time. If I have any concerns about this project, I may contact the convenor of the Research and Ethics Committee.

Participant's Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix 6

### Diagnostic criteria for Attention-Deficit/Hyperactivity Disorder

(American Psychiatric Association, 2000).

A. Either (1) or (2):

(1) *inattention*: six (or more) of the following symptoms of inattention have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

(a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities

(b) often has difficulty sustaining attention in tasks or play activities

(c) often does not seem to listen when spoken to directly

(d) often does not follow through on instructions and fails to finish school work, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions)

(e) often has difficulty organizing tasks and activities

(f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)

(g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)

(h) is often easily distracted by extraneous stimuli

(i) is often forgetful in daily activities

(2) *hyperactivity-impulsivity*: six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

#### Hyperactivity

(a) often fidgets with hands or feet or squirms in seat

(b) often leaves seat in classroom or in other situations in which remaining seated is expected

(c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)

(d) often has difficulty playing or engaging in leisure activities quietly

(e) is often "on the go" or often acts as if "driven by a motor"

(f) often talks excessively

#### Impulsivity

(g) often blurts out answers before questions have been completed

(h) often has difficulty awaiting turn

(i) often interrupts or intrudes on others (e.g., butts into conversations or games)

## Appendix 7

### Functional Assessment Interview Form

**Interviewer(s):** \_\_\_\_\_

**Student:** \_\_\_\_\_

**Teacher:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Behaviour:** \_\_\_\_\_

*Please fill out a form for each behaviour.*

- (1) Describe the behaviour:
- (2) How often does the behaviour occur?
- (3) How long does it last?
- (4) How intense is the behaviour?
- (5) What is happening when the behaviour occurs?
- (6) When is the behaviour most likely to occur?
- (7) Where is the behaviour most likely to occur? i.e., in the classroom.
- (8) When is the behaviour least likely to occur? i.e., during free time.
- (9) Where is the behaviour least likely to occur? i.e., in the playground.
- (10) Is there a specific task that seems to trigger the behaviour?
- (11) Are there certain things that this person enjoys doing where the behaviour does not occur?
- (12) With whom is the behaviour most likely to occur?
- (13) With whom is the behaviour least likely to occur?
- (14) What events are likely to set off the behaviour?
- (15) How can you tell the behaviour is about to start?
- (16) What usually happens after a behaviour? What are the consequences?
- (17) How do people respond to the behaviour? Do they provide the student with attention, or do they ignore the behaviours?
- (18) What do you think the function of the behaviour is? Why does the student behave this way? What does the student gain? What does the student avoid?
- (19) What behaviours might serve the same function that is appropriate within the classroom?

## Appendix 8

### Problem Behaviour Questionnaire

#### PROBLEM BEHAVIOR QUESTIONNAIRE PROFILE

Respondent Information							
Student _____	DOB _____	Grade _____	Sex: ___	IEP: Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Teacher _____	School _____						
Telephone _____	Date _____						

Student Behavior (please briefly describe the problem behavior):

**DIRECTIONS:** Keeping in mind a typical episode of the problem behavior, circle the frequency at which each of the following statements are true.

	PERCENT OF THE TIME						
	Never	10%	25%	50%	75%	90%	Always
1. Does the problem behavior occur and persist when you make a request to perform a task?	0	1	2	3	4	5	6
2. When the problem behavior occurs do you redirect the student to get back to task or follow rules?	0	1	2	3	4	5	6
3. During a conflict with peers, if the student engages in the problem behavior do peers leave the student alone?	0	1	2	3	4	5	6
4. When the problem behavior occurs do peers verbally respond or laugh at the student?	0	1	2	3	4	5	6
5. Is the problem behavior more likely to occur following a conflict outside the classroom? (e.g., bus write up)	0	1	2	3	4	5	6
6. Does the problem behavior occur to get your attention when you are working with other students?	0	1	2	3	4	5	6
7. Does the problem behavior occur in the presence of specific peers?	0	1	2	3	4	5	6
8. Is the problem behavior more likely to continue to occur throughout the day following an earlier episode?	0	1	2	3	4	5	6
9. Does the problem behavior occur during specific academic activities?	0	1	2	3	4	5	6
10. Does the problem behavior stop when peers stop interacting with the student?	0	1	2	3	4	5	6
11. Does the behavior stop when peers are attending to other students?	0	1	2	3	4	5	6
12. If the student engages in the problem behavior do you provide one-on-one instruction to get student back on-task?	0	1	2	3	4	5	6
13. Will the student stop doing the problem behavior if you stop making requests or end an academic activity?	0	1	2	3	4	5	6
14. If the student engages in the problem behavior, do peers stop interacting with the student?	0	1	2	3	4	5	6
15. Is the problem behavior more likely to occur following unscheduled events or disruptions in classroom routines?	0	1	2	3	4	5	6

PROBLEM BEHAVIOR QUESTIONNAIRE PROFILE

Student \_\_\_\_\_ Grade \_\_\_\_\_  
 School \_\_\_\_\_ Date \_\_\_\_\_

DIRECTIONS: Circle the score given for each question from the scale below the corresponding question number (in bold).

PEERS			ADULTS			SETTING EVENTS								
Escape			Attention			Escape			Attention					
<b>3</b>	<b>10</b>	<b>14</b>	<b>4</b>	<b>7</b>	<b>11</b>	<b>1</b>	<b>9</b>	<b>13</b>	<b>2</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>8</b>	<b>15</b>
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ANALYSIS OF POSSIBLE FUNCTION(S) OF STUDENT BEHAVIOR

## Appendix 9

### Disruptive Behaviour Disorders Rating Scale- Teacher Form

#### Parent / Teacher DBD Rating Scale

Child's Name: \_\_\_\_\_ Form Completed by: \_\_\_\_\_

Grade: \_\_\_\_\_ Date of Birth: \_\_\_\_\_ Sex: \_\_\_\_\_ Date Completed: \_\_\_\_\_

Check the column that best describes your/this child. Please write DK next to any items for which you don't know the answer.

	Not at All	Just a Little	Pretty Much	Very Much
1. often interrupts or intrudes on others (e.g., butts into conversations or games)				
2. has run away from home overnight at least twice while living in parental or parental surrogate home (or once without returning for a lengthy period)				
3. often argues with adults				
4. often lies to obtain goods or favors or to avoid obligations (i.e., "cons" others)				
5. often initiates physical fights with other members of his or her household				
6. has been physically cruel to people				
7. often talks excessively				
8. has stolen items of nontrivial value without confronting a victim (e.g., shoplifting, but without breaking and entering; forgery)				
9. is often easily distracted by extraneous stimuli				
10. often engages in physically dangerous activities without considering possible consequences (not for the purpose of thrill-seeking), e.g., runs into street without looking				
11. often truant from school, beginning before age 13 years				
12. often fidgets with hands or feet or squirms in seat				
13. is often spiteful or vindictive				
14. often swears or uses obscene language				
15. often blames others for his or her mistakes or misbehavior				
16. has deliberately destroyed others' property (other than by fire setting)				
17. often actively defies or refuses to comply with adults' requests or rules				
18. often does not seem to listen when spoken to directly				
19. often blurts out answers before questions have been completed				
20. often initiates physical fights with others who do not live in his or her household (e.g., peers at school or in the neighborhood)				
21. often shifts from one uncompleted activity to another				
22. often has difficulty playing or engaging in leisure activities quietly				
23. often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities				
24. is often angry and resentful				
25. often leaves seat in classroom or in other situations in which remaining seated is expected				
26. is often touchy or easily annoyed by others				
27. often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behavior or failure to understand instructions)				
28. often loses temper				
29. often has difficulty sustaining attention in tasks or play activities				
30. often has difficulty awaiting turn				
31. has forced someone into sexual activity				
32. often bullies, threatens, or intimidates others				
33. is often "on the go" or often acts as if "driven by a motor"				
34. often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)				
35. often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)				
36. has been physically cruel to animals				
37. often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)				
38. often stays out at night despite parental prohibitions, beginning before age 13 years				
39. often deliberately annoys people				
40. has stolen while confronting a victim (e.g., mugging, purse snatching, extortion, armed robbery)				
41. has deliberately engaged in fire setting with the intention of causing serious damage				
42. often has difficulty organizing tasks and activities				
43. has broken into someone else's house, building, or car				
44. is often forgetful in daily activities				
45. has used a weapon that can cause serious physical harm to others (e.g., a bat, brick, broken bottle, knife, gun)				

parentteacherdbd.v1

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**SCORING INSTRUCTIONS FOR THE DISRUPTIVE BEHAVIOR DISORDER RATING SCALE**

There are two ways to determine if a child meets the criteria for DSM IV diagnoses of Attention-Deficit/Hyperactivity Disorder, Oppositional Defiant Disorder, or Conduct Disorder. The first method involves counting symptoms for each disorder using the Disruptive Behavior Disorders (DBD) rating scale. The second method involves comparing the target child's factor scores on the DBD Rating Scale to established norms. The factor scores method is preferable for diagnosis of females (e.g., using a 2 SD cutoff), as the symptom counting method often results in underdiagnosis of female children. Please note that Items 10, 14, and 21 are from DSM-III-R and are not included in the scoring for a DSM-IV diagnosis.

**Method 1: Counting Symptoms**

To determine if a child meets the symptom criteria for DSM IV diagnoses of Attention-Deficit/Hyperactivity Disorder, Oppositional Defiant Disorder, or Conduct Disorder as measured by the DBD Parent / Teacher Rating Scale, count the number of symptoms that are endorsed "pretty much" or "very much" by either parent or teacher in each of the following categories: Note that impairment and other criteria must be evaluated in addition to symptom counts.

<p><b>Attention-Deficit/Hyperactivity Disorder</b></p> <p>_____ Attention-Deficit/Hyperactivity Disorder - Inattention Symptoms          (items 9, 18, 23, 27, 29, 34, 37, 42, 44)</p> <p>6 or more items must be endorsed as "pretty much" or "very much" to meet criteria for <b>Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type</b>. The six items may be endorsed on the teacher DBD, the parent DBD, or can be a combination of items from both rating scales (e.g., 4 symptoms endorsed on the teacher DBD and 2 separate symptoms endorsed on the parent DBD). The same symptom should <b>not</b> be counted twice if it appears on both versions (parent and teacher) of the rating scale.</p> <p>_____ Attention-Deficit/Hyperactivity Disorder - Hyperactivity/impulsivity Symptoms          (items 1, 7, 12, 19, 22, 25, 30, 33, 35)</p> <p>6 or more items must be endorsed as "pretty much" or "very much" on the parent and/or the teacher DBD to meet criteria for <b>Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type</b>          If 6 or more items are endorsed for Attention-Deficit/Hyperactivity Disorder - inattention <b>and</b> 6 or more items are endorsed for Attention-Deficit/Hyperactivity Disorder - hyperactivity/impulsivity, then criteria is met for <b>Attention-Deficit/Hyperactivity Disorder, Combined Type</b></p> <p><b>Some impairment from the symptoms must be present in two or more settings (e.g., school, home)</b> _____</p> <p><b>Oppositional Defiant Disorder</b>          _____ Oppositional Defiant Disorder (items 3, 13, 15, 17, 24, 26, 28, 39)</p> <p>A total of 4 or more items must be endorsed as "pretty much" or "very much" on either the parent or the teacher DBD to meet criteria for <b>Oppositional Defiant Disorder</b></p> <p><b>Conduct Disorder</b>          _____ Conduct Disorder - aggression to people and animals (items 6, 20, 31, 32, 36, 40, 45)          _____ Conduct Disorder - destruction of property (items 16, 41)          _____ Conduct Disorder - deceitfulness or theft (items 4, 8, 43)          _____ Conduct Disorder - serious violation of rules (items 2, 11, 38)</p> <p>A total of 3 or more items in any category or any combination of categories must be endorsed as "pretty much" or "very much" on either the parent or the teacher DBD to meet criteria for <b>Conduct Disorder</b></p>
--

**Method 2: Using Factor Scores**

Factor scores for the two ADHD and ODD dimensions for teacher ratings on the DBD are reported in Pelham, et al (1992), Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders: *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 210-218. The factor scores for DSM IV factors are the same as for the DSM III-R factors reported in that paper. To determine how a child's scores compare to normative data, compute the average rating for the items from each factor (listed below) using the following scoring: Not at all = 0, Just a little = 1, Pretty Much = 2, Very much = 3. Then, using the information from the attached table of norms, determine where the child falls in relation to other children. A variety of cutoff scores can be used (e.g., 2 standard deviations above the mean).

<b>Factors</b>	
Oppositional / Defiant	(items 3, 13, 15, 17, 24, 26, 28, 39)
Inattention	(items 9, 18, 23, 27, 29, 34, 37, 42, 44)
Impulsivity / Overactivity	(items 1, 7, 12, 19, 22, 25, 30, 33, 35)



## Appendix 11

### Operational Definitions

*Joel:*

#### **OFF-TASK-MOTOR**

**Physically touching another student when not related to an academic task**

**(OFF-M-P):** Attempting to or actually engaging in a physical act which causes harm to another person or inappropriately intruding on another by restricting that person's freedom of movement.

Examples: Hitting, throwing an object (regardless of whether or not the object hits the intended victim). Holding another person down on the ground, and/or hitting another person with a book. Pinching, scratching, kicking, pushing, pulling, slapping, biting, spitting, poking, and/or, touching.

Target behaviour must have stopped for more than 3secs to count as a separate event.

**Appropriate behaviour:** Any form of physical contact with the hands, fist, or feet that is directed by the teacher; i.e., bull rush.

**Banging class materials and/or furniture, causing a loud disruptive noise (OFF-**

**M-BANG):** The student deliberately bangs into, and/or picks up, slams, a desk, table, book, pencil, pen, tray, bag and/or chair causing a loud disruptive noise. Stomping loudly around the room when the student is required to walk quietly is also recorded as OFF-M-BANG. The noise must be loud enough to be termed 'disruptive'.

There must be 2secs between each event to count as a separate event.

**Appropriate behaviour:** The student moves around the room quietly and cautiously without causing a loud disruption to the class.

**Playing with objects and/or toys (OFF-M-TOY):** The student engages in 'play' with inappropriate materials (i.e., toys, erasers, rulers) when they have been instructed to do a task. For example throwing pencils/erasers into the air and catching them.

There must be a 3sec break in the target behaviour to count as a separate state.

**Appropriate behaviour:** The student does not engage in inappropriate play when they have been instructed to perform a task.

#### **OFF-TASK-VERBAL**

**Verbally off task (OFF-VERBAL)**

- Making any audible sound, such as whistling, humming, forced burping, laughing to self, singing to self, and/or weird noises.
- Talking to another student about an assigned academic task, or any other topic, when such talk is prohibited by the teacher, i.e., talking through quiet reading time and test situations is prohibited.
- Complaining when presented with a task demand.
- Spoken words, either friendly, or negative in content, are directed at either the teacher without first obtaining permission to speak or unsolicited at classmates during inappropriate times, or during work periods.
- Calling out answers to academic problems when the teacher has not specifically asked for an answer or permitted such behaviour.

- Calling out across the room to other students and/or teachers.
- Interrupts other students when they are speaking while in a group situation.
- Interrupts other student's conversations.
- Inappropriate volume for task at hand.

**Crying (OFF-V-CRY):** Student shows emotional distress, with tears, and/or sobbing, with head down in lap, and/or arms in a slouched position in response to teacher instruction, and/or classmates comments.

The target behaviour must stop for 5secs to count as a separate state.

*Brad:*

### **OFF-TASK-MOTOR**

#### **Physically touching another student when not related to an academic task**

**(OFF-M-P):** Attempting to or actually engaging in a physical act which causes harm to another person or inappropriately intruding on another by restricting that person's freedom of movement.

Examples: Hitting, throwing an object (regardless of whether or not the object hits the intended victim). Holding another person down on the ground, and/or hitting another person with a book. Pinching, scratching, kicking, pushing, pulling, slapping, biting, spitting, poking, and/or, touching.

Target behaviour must have stopped for more than 3secs to count as a separate event.

**Appropriate behaviour:** Any form of physical contact with the hands, fist, or feet that is directed by the teacher; i.e., bull rush.

**Sharpening pencil/s (OFF-M-P):** The student is at the rubbish bin or at their desk sharpening pencils instead of focusing on the task instructed by the teacher.

State is observed from the time the student starts to sharpen their pencil until they stop. The target behaviour is said to stop when pencil sharpening has not occurred for 3secs.

**Appropriate behaviour:** The student does not sharpen pencils when they have been assigned a task.

**Pretending to smoke (OFF-M-S):** The student makes a 'V' shape with any two fingers and brings them to the mouth (does not have to make contact with the mouth to be considered 'smoking') and pretends to smoke. Materials, for example, pens may be used as cigarettes.

There must be 3secs between the state for the target behaviour to count as a separate state.

**Appropriate behaviour:** The student does not engage in gestured 'smoking' behaviours.

**Pretending to shoot peers and teachers (OFF-M-S):** The student makes a gun shape with his fingers and/or materials (i.e., rulers) and pretends to shoot peers, either with, or without sound effects; i.e., "bang".

There must be 3secs between the state for the target behaviour to count as a separate state.

**Appropriate behaviour:** The student does not engage in gestured gun behaviours.

**Banging class materials and/or furniture, causing a loud disruptive noise (OFF-M-BANG):** The student deliberately bangs into, and/or picks up, slams, a desk, table, book, pencil, pen, tray, bag and/or chair causing a loud disruptive noise. Stomping loudly around the room when the student is required to walk quietly is also recorded as OFF-M-BANG. The noise must be loud enough to be termed ‘disruptive’.

There must be 2secs between each event to count as a separate event.

**Appropriate behaviour:** The student moves around the room quietly and cautiously without causing a loud disruption to the class.

**Playing with objects and/or toys (OFF-M-TOY):** The student engages in ‘play’ with inappropriate materials (i.e., toys, erasers, rulers) when they have been instructed to do a task. For example throwing pencils/erasers into the air and catching them.

There must be a 3sec break in the target behaviour to count as a separate state.

Tapping a pencil between/in hands/legs/knees/feet is not classified as OFF-M-TOY.

**Appropriate behaviour:** The student does not engage in inappropriate play when they have been instructed to perform a task.

### **OFF-TASK-VERBAL**

- Making any audible sound, such as whistling, humming, forced burping, laughing to self, singing to self, and/or weird noises.
- Talking to another student about an assigned academic task, or any other topic, when such talk is prohibited by the teacher, i.e., talking through quiet reading time and test situations is prohibited.
- Complaining when presented with a task demand.
- Spoken words, either friendly, or negative in content, are directed at either the teacher without first obtaining permission to speak or unsolicited at classmates during inappropriate times, or during work periods.
- Calling out answers to academic problems when the teacher has not specifically asked for an answer or permitted such behaviour.
- Calling out across the room to other students and/or teachers.
- Interrupts other students when they are speaking while in a group situation.
- Interrupts other student’s conversations.
- Inappropriate volume for task at hand.
- Making inappropriate and/or unauthorised comments or remarks about a task at hand, another student/teacher, pictures in a book, and/or using inappropriate language.

There must be 1sec between each event to count as a separate event.

- Making inappropriate and/or unauthorised comments or remarks about a task at hand, another student/teacher, pictures in a book, and/or using inappropriate language.

There must be 1sec between each event to count as a separate event.

## Appendix 12

### Example of Palm Data Collection

3.71	75210	callum	0	OFF-VERBAL
14.5	75220	callum	0	OFF-VERBAL
15.45	75221	callum	0	OFF-VERBAL
28.79	75235	callum	0	OFF-VERBAL
86.96	75293	callum	0	OFF-M-P
87.56	75293	callum	0	OFF-VERBAL
91.03	75297	callum	1	OFF-M-TOY
93.79	75300	callum	0	OFF-VERBAL
100.5	75306	callum	0	OFF-VERBAL
148.12	75354	callum	0	OFF-M-TOY
293.88	75500	callum	0	NON-COM
294.53	75500	callum	0	OFF-VERBAL
320.57	75526	callum	0	NON-COM
444.45	75650	callum	0	OFF-VERBAL
610.08	75816	callum	0	OFF-VERBAL
611.53	75817	callum	0	OFF-VERBAL
612.95	75819	callum	0	OFF-VERBAL
617.76	75824	callum	0	OFF-VERBAL
620.64	75826	callum	0	OFF-VERBAL
689.31	75895	callum	0	NON-COM
820.56	76026	callum	0	OFF-VERBAL
931.66	76137	callum	0	OFF-VERBAL
933.42	76139	callum	0	OFF-VERBAL
938.47	76144	callum	1	OFF-M-TOY
939.52	76145	callum	0	NON-COM
989.11	76195	callum	0	OFF-VERBAL
990.1	76196	callum	0	OFF-M-TOY
1171.93	76378	callum	0	OFF-M-P
1172.97	76379	callum	0	OFF-VERBAL
1173.57	76379	callum	0	OFF-VERBAL
1443.65	76649	callum	0	OFF-VERBAL
1446.35	76652	callum	0	OFF-VERBAL
1450.38	76656	callum	0	OFF-VERBAL
1455.71	76662	callum	0	OFF-VERBAL
1524.75	76731	callum	0	OFF-M-P
1527.96	76734	callum	0	OFF-M-P

**Appendix 13**

**Palm Record  
Palm Record**

<b>Observer</b>				
<b>Student</b>				
<b>Date/Day</b>				
<b>Setting</b>				
<b>Time Period</b>				
<b>Wrong Button</b>				

<b>Observer</b>				
<b>Student</b>				
<b>Date/Day</b>				
<b>Setting</b>				
<b>Time Period</b>				
<b>Wrong Button</b>				

<b>Observer</b>				
<b>Student</b>				
<b>Date/Day</b>				
<b>Setting</b>				
<b>Time Period</b>				
<b>Wrong Button</b>				

## Appendix 14

### Student-Assisted Functional Assessment Interview

Student \_\_\_\_\_

Date \_\_\_\_\_

Interviewer \_\_\_\_\_

---

#### Section 1

**Answer either always, sometimes, or never to the questions below.**

1. In general, is your work too hard for you?
  2. In general, is your work too easy for you?
  3. Do you think work periods for each subject are too long?
  4. Do you think work periods for each subject are too short?
  5. Do you like working with other people?
  6. Do you like working alone?
  7. Do you think you get the points or rewards you deserve when you do a good job?
  8. Do you think you would do better in school if you received more rewards?
  9. In general do you find your work interesting?
  10. Are there things in the classroom that distract you?
  11. Is your work challenging enough for you?
  12. Do you think people notice when you do a good job?
- 

#### Section 2

1. What subjects do you like most? \_\_\_\_\_  
\_\_\_\_\_
2. What subjects do you dislike? \_\_\_\_\_  
\_\_\_\_\_
3. What subjects do you find easy? \_\_\_\_\_  
\_\_\_\_\_
4. What subjects do you find hard? \_\_\_\_\_  
\_\_\_\_\_

5. What do you do when you need help from the teacher? \_\_\_\_\_  
\_\_\_\_\_
6. Which ways are the best at getting teacher attention? \_\_\_\_\_  
\_\_\_\_\_
7. Which ways are not so good at getting the teachers attention? \_\_\_\_\_  
\_\_\_\_\_
8. What are your favourite activities at school? \_\_\_\_\_  
\_\_\_\_\_
9. What are your interests or hobbies? \_\_\_\_\_  
\_\_\_\_\_
10. What kind of rewards would you like to earn for good behaviour or good school work? \_\_\_\_\_  
\_\_\_\_\_
11. If you had the chance, what activities would you like to do that you don't have the opportunity to do now? \_\_\_\_\_  
\_\_\_\_\_
12. If you were provided with free time during class, what might you do? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix 15

### Intervention Rating Profile (IRP-15)

Teacher \_\_\_\_\_ Date \_\_\_\_\_

Intervention \_\_\_\_\_ Student \_\_\_\_\_

Behaviour(s) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**The purpose of this questionnaire is to assess your perceptions of the acceptability, feasibility, and perceived effectiveness of the functional behavioural assessment (FA) process; interviews, initial observations, and hypothesis development, and subsequent interventions.**

**1=strongly disagree**

**2=disagree**

**3=slightly disagree**

**4=slightly agree**

**5=agree**

**6=strongly agree**

- |   |          |          |          |          |          |          |
|---|----------|----------|----------|----------|----------|----------|
| (1) Teachers are likely to use this intervention because it requires little technical skills.   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (2) Teachers are likely to use this intervention because it requires little training to implement effectively.                                  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (3) I found the FA process and subsequent intervention suitable for the problem behaviour described.  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (4) Most teachers would find the FA process and subsequent intervention appropriate for behaviour problems in addition to the one(s) described. | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (5) The child's behaviour problem was severe enough to warrant the use of FA and intervention.  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |

- |  |          |          |          |          |          |          |
|--|----------|----------|----------|----------|----------|----------|
| (6) This intervention was not difficult to implement in a classroom with 30 other students.                    | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (7) This intervention was practical in the amount of time required for contact with school staff.              | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (8) The FA process and subsequent intervention was not disruptive to other students.                           | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (9) It was not difficult to use this intervention and still meet the needs of other students in the classroom. | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (10) This intervention proved effective in decreasing off-task behaviour.                                      | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (11) This intervention did not result in negative side-effects for the student.                                | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (12) This intervention did not result in risk to the student.  | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (13) I would suggest the use of FA and this intervention to other teachers.                                    | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (14) Overall, the FA process and intervention were beneficial for the student.                                 | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |
| (15) I would reuse this intervention in the classroom.   | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> |

**Comments:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## Appendix 16

### Student Intervention Rating Profile

Student \_\_\_\_\_

Date \_\_\_\_\_

Method \_\_\_\_\_

Teacher \_\_\_\_\_

Recently your classroom teacher introduced some new methods to decrease off-task behaviours such as; calling out and interrupting. Could you please rate each method using a rating scale of 1-6.

1=strongly disagree

2=disagree

3=slightly disagree

4=slightly agree

5=agree

6=strongly agree

**PLEASE CIRCLE THE NUMBER THAT CORRESPONDS TO YOUR ANSWER**

- |  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| (1) The method(s) used to deal with my off-task behaviour were fair.                               | 1 | 2 | 3 | 4 | 5 | 6 |
| (2) The method(s) used were too harsh.   | 1 | 2 | 3 | 4 | 5 | 6 |
| (3) The method(s) used to deal with my off-task behaviour caused problems with my friends.         | 1 | 2 | 3 | 4 | 5 | 6 |
| (4) There could have been a better method(s) to deal with my off-task behaviour.                   | 1 | 2 | 3 | 4 | 5 | 6 |
| (5) The method(s) used with me would be good to use on other children.                             | 1 | 2 | 3 | 4 | 5 | 6 |
| (6) I liked the method(s) used by my teacher.  | 1 | 2 | 3 | 4 | 5 | 6 |
| (7) I think that the method(s) used here with me would help other children to do better in school. | 1 | 2 | 3 | 4 | 5 | 6 |

**Appendix 17**

**Functional Assessment Interview Form**

Interviewer(s): \_\_\_\_\_

Student: \_\_\_\_\_

Teacher: \_\_\_\_\_

Date: \_\_\_\_\_

Please fill out a form for each behaviour.

(1) Describe the Behaviour:

- (a) \_\_\_\_\_
- (b) \_\_\_\_\_
- (c) \_\_\_\_\_
- (d) \_\_\_\_\_
- (e) \_\_\_\_\_

(2) When is the behaviour most likely to occur? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(3) When is the behaviour least likely to occur? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(4) What usually happens after the behaviour? What are the consequences? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix 18

### Operational Definitions

*Amy:*

**Non-Compliance (NON-COM):** Amy ignores direct instructions given by the classroom teacher, and/or another adult. For example; the class is asked to put their reading books away and Amy continues to read.

Non-compliance is observed when Amy fails to follow a direct instruction within 5-s. If an instruction is repeated, Amy is required to respond by performing the instruction within 5-s otherwise it is again recorded as non-compliance.

*Appropriate behaviour:* Amy follows instructions within 5-s.

**Physically touching another student when not related to an academic task**

**(OFF-M-P):** Engaging in a physical act which causes harm to another person, or inappropriately intruding on another by restricting that person's freedom of movement. Peers must show some form of discomfort to be recorded as OFF-M-P. For example moving away from the student, asking the student to stop, and/or telling the teacher.

Examples: Hitting, throwing an object (regardless of whether the object hits the intended victim), holding another person down on the ground, hitting another person with a book, pinching, scratching, kicking, pushing, pulling, slapping, biting, spitting, poking, and/or touching.

Does not include appropriate touching. For example; holding hands, and/or games that require physical touching.

Target behaviour must have stopped for more than 3-s to count as a separate event.

**Playing with objects and/or toys (OFF-M-TOY):** Amy engages with materials that are not directly related to the task at hand. For example during silent reading the only materials that Amy should have in her hands would be the book that she is reading. Playing with the pen/cil that she is using will not be counted as a behaviour as this is seen as normal classroom behaviour, for example, chewing the end of the pen/cil, tapping the pen/cil from hand to hand.

Target behaviour must have stopped for more than 3-s to count as a separate state.

*Callum:*

**Non-Compliance (NON-COM):** Callum ignores direct instructions given by the classroom teacher, and/or another adult. For example; the class is asked to put their reading books away and Callum continues to read.

Non-compliance is observed when Callum fails to follow a direct instruction within 5-s. If an instruction is repeated, Callum is required to respond by performing the instruction within 5-s otherwise it is again recorded as non-compliance.

*Appropriate behaviour:* Callum follows instructions within 5-s.

**Physically touching another student when not related to an academic task**

**(OFF-M-P):** Engaging in a physical act which causes harm to another person, or inappropriately intruding on another by restricting that person's freedom of movement. Peers must show some form of discomfort to be recorded as OFF-M-P.

For example moving away from the student, asking the student to stop, and/or telling the teacher.

Examples: Hitting, throwing an object (regardless of whether the object hits the intended victim), holding another person down on the ground, hitting another person with a book, pinching, scratching, kicking, pushing, pulling, slapping, biting, spitting, poking, and/or touching.

Does not include appropriate touching. For example; holding hands, and/or games that require physical touching.

Target behaviour must have stopped for more than 3-s to count as a separate event.

**Playing with objects and/or toys (OFF-M-TOY):** Callum engages with materials that are not directly related to the task at hand. For example during mat time Callum should not be engaging with any materials.

Playing with the pen/cil that he is using will not be counted as a behaviour as this is seen as usual classroom behaviour, for example, chewing the end of the pen/cil, tapping the pen/cil from hand to hand.

Target behaviour must have stopped for more than 3-s to count as a separate state.

### **OFF-TASK-VERBAL**

- Making any audible sound, such as whistling, humming, forced burping, laughing to self, singing to self, and/or weird noises.
- Calling out answers to academic problems when the teacher had not specifically asked for an answer, or permitted such behaviour, calling out across the room to other students and/or teachers.
- Interrupting other students when they are speaking while in a group situation, interrupting other student's conversations.
- Inappropriate volume for task at hand.

## **Appendix 19**

### **The Motivation Assessment Scale (MAS) Information for Teachers**

- Please complete the MAS on  
<http://www2.monacoassociates.com/masontheweb/index.aspx>
- Follow the instructions provided.
- When asked to list the behaviour you may enter more than one behaviour. For example; aggression, non-compliant, calls out etc
- Please read each question carefully. When a question refers to 'a person being left alone' this means that the person is completely alone.
- Print each page using the 'print' icon before submitting each new set of information. If you forget to print the page use the back arrow to return to the previous page.

## Appendix 20

### The Motivation Assessment Scale

**Amy:**

*Rate each of the 16 items on the following two pages by selecting the number that corresponds to about how often the individual engages in the behaviour indicated, in the setting which has been selected.*

01.	Would the behaviour occur continuously, over and over, if this person was left alone for long periods of time? (For example, several hours.)	Never <input type="button" value="v"/>
02.	<b>Does the behaviour occur following a request to perform a difficult task?</b>	Half the Time <input type="button" value="v"/>
03.	<b>Does the behaviour seem to occur in response to your talking to other persons in the room?</b>	Almost Never <input type="button" value="v"/>
04.	<b>Does the behaviour ever occur to get a toy, food or activity that this person has been told that he she can't have?</b>	Never <input type="button" value="v"/>
05.	<b>Would the behaviour occur repeatedly, in the same way, for very long periods of time, if no one was around? (For example, rocking back and forth for over an hour.)</b>	Never <input type="button" value="v"/>
06.	<b>Does the behaviour occur when any request is made of this person?</b>	Half the Time <input type="button" value="v"/>
07.	<b>Does the behaviour occur whenever you stop attending to this person?</b>	Never <input type="button" value="v"/>
08.	<b>Does the behaviour occur when you take away a favourite toy, food, or activity?</b>	Usually <input type="button" value="v"/>
09.	<b>Does it appear to you that this person enjoys performing the behaviour? (It feels, tastes, looks, smells, and/or sounds pleasing.)</b>	Half the Time <input type="button" value="v"/>
10.	<b>Does this person seem to do the behaviour to upset or annoy you when you are trying to get him or her to do what you ask?</b>	Almost Never <input type="button" value="v"/>
11.	<b>Does this person seem to do the behaviour to upset or annoy you when you are not paying attention to him or her? (For example, if you are sitting in a separate room, interacting with another person.)</b>	Never <input type="button" value="v"/>

12.	Does the behaviour stop occurring shortly after you give this person the toy, food or activity he or she has requested?	Never
13.	When the behaviour is occurring, does this person seem calm and unaware of anything else going on around him or her?	Always
14.	Does the behaviour stop occurring shortly after (one to five minutes) you stop working or making demands of this person?	Never
15.	Does this person seem to do the behaviour to get you spend some time with him or her?	Half the Time
16.	Does this behaviour seem to occur when this person has been told that he or she can't do something he or she had wanted to do?	Always

### Motivation Assessment Scale Results

	Sensory	Escape	Attention	Tangible
<b>Total Score :</b>	9	7	4	10
<b>Mean Score :</b>	2.25	1.75	1	2.5
<b>Relative Ranking :</b>	2	3	4	1
<b>About you :-</b>				
Name :	Teacher			
E-mail :				
Organization Type :	Educational (Primary)			
State/Province :				
Country :	New Zealand			
<b>About the individual :-</b>				
Age :	7			
ID (for future reference) :				
Behaviour :	Not following instructions			
Location :	Classroom			

### Callum:

*Rate each of the 16 items on the following two pages by selecting the number that corresponds to about how often the individual engages in the behaviour indicated, in the setting which has been selected.*

01.	<b>Would the behaviour occur continuously, over and over, if this person was left alone for long periods of time? (For example, several hours.)</b>	Never
02.	<b>Does the behaviour occur following a request to perform a difficult task?</b>	Seldom
03.	<b>Does the behaviour seem to occur in response to your talking to other persons in the room?</b>	Always
04.	<b>Does the behaviour ever occur to get a toy, food or activity that this person has been told that he she can't have?</b>	Seldom
05.	<b>Would the behaviour occur repeatedly, in the same way, for very long periods of time, if no one was around? (For example, rocking back and forth for over an hour.)</b>	Never
06.	<b>Does the behaviour occur when any request is made of this person?</b>	Almost Never
07.	<b>Does the behaviour occur whenever you stop attending to this person?</b>	Always
08.	<b>Does the behaviour occur when you take away a favourite toy, food, or activity?</b>	Seldom
09.	<b>Does it appear to you that this person enjoys performing the behaviour? (It feels, tastes, looks, smells, and/or sounds pleasing.)</b>	Half the Time
10.	<b>Does this person seem to do the behaviour to upset or annoy you when you are trying to get him or her to so what you ask?</b>	Never
11.	<b>Does this person seem to do the behaviour to upset or annoy you when you are not paying attention to him or her? (For example, if you are sitting in a separate room, interacting with another person.)</b>	Almost Always
12.	<b>Does the behaviour stop occurring shortly after you give this person the toy, food or activity he or she has requested?</b>	Half the Time
13.	<b>When the behaviour is occurring, does this person seem calm and unaware of anything else going on around him or her?</b>	Almost Always
14.	<b>Does the behaviour stop occurring shortly after (one to five minutes) you stop working or making demands of this person?</b>	Usually

15.	Does this person seem to do the behaviour to get you spend some time with him or her?	Always
16.	Does this behaviour seem to occur when this person has been told that he or she can't do something he or she had wanted to do?	Seldom

### Motivation Assessment Scale Results

	Sensory	Escape	Attention	Tangible
<b>Total Score :</b>	8	7	23	9
<b>Mean Score :</b>	2	1.75	5.75	2.25
<b>Relative Ranking :</b>	3	4	1	2
<b>About you :-</b>				
Name :	Teacher			
E-mail :				
Organization Type :	Educational (Primary)			
State/Province :				
Country :	New Zealand			
<b>About the individual :-</b>				
Age :	7			
ID (for future reference) :				
Behaviour :	calling out			
Location :	on mat in class			