The Use of a Group Contingency Token Economy in a 4/5 Grade Classroom to Increase On-Task Behaviour During Independent Reading

by

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Dedication

I would like to dedicate this thesis to the people I love and who love me. I would not have made it here without you. You know who you are.
Abstract
The diagnosis is steadily increasing in disorders such as Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD) and other learning disabilities. These diagnoses and their increasing prevalence has been shown to affect the learning environment. One common result of these disorders in the classroom are off-task behaviours, which can include; talking-out, standing up, not listening, engaging in defiant behaviour etc. This study used a token economy with a group contingency to increase on-task behaviour during independent reading. A preference assessment was conducted to identify highly preferred items which were then utilized as back-up reinforcement. Data was collected once a day, for 15 minutes during independent reading time. A visual token board was utilized so the students could see their progress towards their back-up reinforcement which was provided at the end of each week. The intervention was an AB design; baseline data was collected for one week with an average of 0% on-task behaviour. The intervention then took place for six-weeks which resulted in an increase of on-task behaviour with an average of 41.6%. The hypothesis was confirmed using the use of visual analysis to thoroughly analyze the results of the intervention.
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Chapter I: Introduction

Overview

Challenging behaviours in the classroom can often affect students’ learning and social-emotional development (Chen & Lindo, 2018). It is critical to intervene with these challenging behaviours early on to prevent them from persisting and becoming long-term challenges (Larkin, Hawkins & Collins, 2016). Chen and Lindo (2018) stated that off-task behaviour in elementary school children has been linked to a reduction in academic achievement in the classroom. Allen and Barber (2015) also explained that often elementary aged students will act out and misbehave in an attempt to regain control over a certain situation because they have difficulty expressing their needs. These points paired with the fact that students are expected to meet and/or exceed the expected academic standards by the end of each grade, can make it difficult for students to succeed at school (Allen & Barber, 2015).

This project was based in a Grade four/five classroom (26 students; 23 Grade four students and three Grade five students) where a number of students required extra support. There were three children who were English as a Second Language (ESL) students, three diagnosed with Autism Spectrum Disorder (ASD), and one student with a suspected ASD diagnosis; there were also a handful of students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). In addition to these diagnosed needs, there were multiple students who engaged in off-task and disruptive behaviours which are commonly found within the ADHD DSM-5 criteria. The DSM-5 explains that ADHD causes inattention and can result in off-task behaviour (American Psychiatric Association, 2013). There was also one student who displayed potential early signs of a mood disorder; extreme moodiness, negativity, attitude towards teachers etc.

Rationale

Prior to this research, there was a modified token economy implemented within the classroom. This token economy was a simple points system including two sets of ten squares on the whiteboard, one for the class and one for the teachers. The students had a set of red magnetic circles and the teachers had blue circles. The students were able to receive a point for being on-task, but this system was not consistently reinforced or utilized. The teachers received a point when the students were not engaged in on-task behaviour or displaying noncompliance. If the students reached ten points within one week (Monday-Friday), they had the opportunity to play a game for a short period of time. However, when the teachers won there was no set consequence, just a brief discussion about appropriate and not appropriate behaviours in the classroom. The students were already familiar with the routine of engaging in on-task behaviour and accessing a reward, which gave the placement student a starting point from which to begin refining and improving this system. Another reason for using a group contingency token economy was that there were many students who were low-level readers or non-readers. This meant that plenty of them would have greatly benefitted from one-on-one time with the teachers. All of the disruptive behaviours and distractions in the classroom made this very difficult. Many disruptive behaviours were due to diagnosed needs such as ADHD or ASD, however, during direct observations in the classroom, it was also seen that many students engaged in hyperactive behaviours who did not have a diagnosis of ADHD. By successfully decreasing off-task behaviours there would be more time for teaching and learning.

Hypothesis

By implementing a group contingency token economy, the goal was to increase on-task behaviour during independent reading. It was hypothesized that if a token economy with a group
contingency was implemented during independent reading, then there would be an increase in on-task behaviour in the classroom.

**Overview of Chapters**

The following chapter will cover the relevant literature pertaining to this intervention. It will take an in-depth look at each of the diagnosed needs in the classroom and how these can individually affect reading ability, learning, and the classroom environment. The methods chapter will include an overview of the participants, the techniques used, and the intended outcomes of this intervention. This section will also include a rationale and a list of the materials used to implement the project. The results section will cover the success of the intervention and include a summary of the project. In addition, the conclusion/discussion section will discuss any strengths and limitations found during the implementation of the project as well as how this project is relevant to the Behavioural Psychology and Applied Behavioural Analysis fields.
Chapter II: Literature Review

Attention Deficit Hyperactivity Disorder (ADHD)

**Prevalence of ADHD.** The target classroom had a high number of children who had been diagnosed with ADHD. As previously stated, the DSM-5 explains that ADHD can appear as serious disruptive and hyperactive behaviours (American Psychiatric Association, 2013). Swank and Smith-Adcock (2018) reviewed an American survey and found that 11% of American children were diagnosed with ADHD in their lifetime (6.4 million children). This article demonstrates that a great number of children have received a diagnosis of ADHD, and it is common across genders and ethnicities. The American Psychiatric Association claims that ADHD is the most common mental health disorder to affect children; they state that 5-11% of all children will receive a diagnosis of ADHD (American Psychiatric Association, 2013). The literature on ADHD supports the direct observations of off-task behaviour and how the effects of hyperactive behaviours can negatively impact a classroom.

**Comorbid ADHD and word reading difficulties and disabilities.** It was found by Tamm et al. (2017) that ADHD is often diagnosed along with word-reading difficulties and disabilities (RD). This comorbid diagnosis suggests that children with ADHD also have difficulties with reading and word comprehension. Between 25 and 40% of children diagnosed with ADHD also have a diagnosis of RD (Tamm et al., 2017). Ehm et al. (2016) explain that often children diagnosed with ADHD show underachievement in their academic skills. They also state that it is common in children with ADHD to have more difficulties in learning to read, reading comprehension and in decoding (forming letters into phrases) than typically developing (TD) children.

**ADHD and academic success.** Ehm et al. (2017) explain how deficits in reading can affect almost every other academic subject including math, language, science, spelling etc. This emphasizes the importance of focusing on increasing positive behaviours during class time where reading skills are developed. Ogg, Volpe, and Rogers (2016) found in their study that it is possible to predict the academic future of young children with ADHD. The findings from their study on the relationship between inattentive behaviours and outcomes in literacy concluded that their participants with ADHD had lower academic scores at the 8-year follow-up in comparison to the control group.

English as a Second Language (ESL)

**Discrimination towards ESL.** In a book review by Gallardo (2011), he explains that the authors have found that there is a large deal of discrimination and prejudice towards immigrants and ESL students in schools in America. These negative views of others can cause social problems and hostility in schools. These problems were prevalent in the placement school because it had over 70 immigrants from Syria, which accounted for approximately 33% of the student population. The need to belong is an absolutely fundamental need that, when fulfilled, can improve a person’s psychological well-being (Schachner, Schwarzenthal, Vijver, & Noack (2018). This being said, they also found that immigrants who felt included and that they belonged at school had higher academic and individual results.

**Reading development in ESL students.** Lesaux and Siegel (2003) explain that although there is plenty of research on how children who speak English learn to read in English, there is a gap in the research for children learning to read English as a second language. However, the authors state that it is proven that when a child is being taught to read in a language that they are not yet fully proficient in, they may experience additional reading problems in the future (Lesaux & Siegel, 2003). Al Otaiba et al. (2009) explain that there is concern over the fact that, by the
time ESL students reach Grade 4, they are not able to read at the necessary level to be successful in an English-speaking school or excel with an English education (this specific study looked at Spanish speaking students). Al Otaiba et al. (2009) also discussed how this affects the number of ESL students who participate in special education and who end up dropping out of school. A study by Al Otaiba et al. (2009) exemplified how ESL (Latino) students are three times more likely not to finish school in comparison to native-English speaking students.

**Autism Spectrum Disorder (ASD)**

**ASD in the classroom.** The DSM-5 states that social interaction and social communication are common deficits for those individuals diagnosed with ASD (American Psychiatric Association, 2013). This underdeveloped social behaviour can cause difficulties with other children in a classroom. During direct observations, these deficits were observed in different ways from multiple students with a diagnosis of ASD in the classroom. One student was very high functioning when it came to their reading and writing skills but was lower functioning in their social interactions. Another student diagnosed with ASD was low functioning in both the social aspect and the academic aspect of their schooling. Simon (2016) explains that ASD is a very complex syndrome and symptoms are different in every individual diagnosed with ASD. Simon (2016) also states that in the classroom it is very important for children with ASD to have a regular routine. Along with this, he states that visual prompts are pertinent to assisting in learning; in the target classroom there were visual prompts for almost everything. In the target classroom there was also a table at the back for the one student who was non-verbal with a diagnosis of ASD; this separate table had different stimulatory objects (i.e. rice bucket). Simon (2016) states that different forms of stimulation in the classroom can greatly benefit children diagnosed with ASD.

**Reading comprehension in students diagnosed with ASD.** In a study completed by Knight, Blacher, and Eisenhower (2018), they discovered that reading comprehension in children diagnosed with ASD is significantly lower than that of typically developing children. Simon (2016) states that it is very common for individuals with ASD to need consistent and substantial supports throughout their academic careers. He also explains that approximately 71% of children with ASD have one comorbid condition and 41% have two or more. He states that in 31% of children with ASD, there is an accompanying intellectual disability, which can affect learning and make specific academic areas (i.e. reading) more difficult. Bailey, Arciuli, and Stancliffe (2017) state that children diagnosed with ASD very commonly have deficits in cognition and oral language which are two incredibly important components when it comes to learning to read and is another reason as to why children with ASD can have more difficulties when learning to read. Nation, Clarke, Wright, and Williams conducted a study on 41 children with ASD (aged 6-15), this study aimed to explore the reading and comprehension ability of children with ASD (as found in Bailey, Arciuli & Stancliffe, 2017). This study found that a significant number of the participants had difficulties in reading accuracy, with 22% not being able to read single words.

**School to Community**

The research is severely lacking in the field of school to community children. It is a new concept and the title “school to community” could vary from school board to school board, however, the concept remains the same. School to community is the term for students who are unlikely to succeed academically in post-secondary education and are therefore taught life-skills so they are more likely to succeed in the work force after high school. These students will likely continue straight into the work force and they need to have the necessary skills to successfully become independent. There were three students who were in the school to community program
in the target classroom, one of whom was also diagnosed with ASD. These students were placed in the school to community program because they were functioning far below Grade level and they had signs of academic difficulties. These students were very low or non-readers, they had low levels of letter and sound comprehension and they were also lower functioning in other subjects such as math and science. All of these students were however, higher functioning in art and were all very creative. The school to community program taught these students skills they would need to live independently and thrive as much as possible in the work force (i.e. baking). School to community also provides better one-on-one teaching for the students who need it most; the students were taken out of the regular classroom daily to complete other learning tasks at their level and in a way that would benefit them the best. Doll and Hess (2001) explain that not receiving a high school diploma can result in poverty and underemployment as well as social distress. This is one of the problems the school to community program is aiming to help improve. The hope is to give the students what they need to complete high school and continue into the workforce after that.

**On-Task Behaviour**

There is plenty of research to back up the idea that the more on-task behaviour students engage in, the more they will be able to learn. For example, in the Beginning Teacher Evaluation Study (BTES) conducted by Marliave, Fisher, and Dishaw, it was found that the number of minutes spent successfully on a task by students was directly related to their achievement in math and reading at the Grade 5 level (as found in Karweit, N., & Slavin, 1982). King, Bradley, Jenson, and O’Neill (2017) provide some statistics on on-task behaviour and academic success; they state that children who struggle in the classroom engage in 50% or less on-task behaviour, whereas the average student is on-task 77-89% of the time. King et al. (2017) explain that the reason these students have academic difficulties is because they are missing important instructions while being off-task. They continue to state that interventions that aim to increase on-task behaviour will also show an increase in academic achievement. In Karweit and Slavin’s 1982 study, they tested how relevant on-task behaviour is in the classroom during mathematics. They looked at how “being on-task” affected learning and how it was different when operational definitions were altered, number of observations made was changed and number of days recording was changed. This was done across multiple grades (2-4) in 18 different classrooms. The data showed that there was a correlation between on-task behaviour and learning. The number of on-task minutes during a math lesson was significant in predicting the score on math tests.

**Group Contingency Token Economy**

**Group contingency.** Litoe and Pumroy (1975) make an interesting statement that a group contingency helps to remove the social reinforcers to a few select deviant children. Simply put, the social reinforcement that disruptive students receive from their peers can be eliminated by a group contingency. This is because a group contingency does not give reinforcement unless every student is engaging in the positive behaviour. Therefore, other students would give less attention to those few disruptive students which would remove the function of peer attention. This is relevant to the target classroom because a large majority of the disruptions in the classroom came from a few select students. Hypothetically speaking, Litoe and Pumroy’s theory about reducing peer attention would apply, once the rest of the class realized they were rewarded for staying on-task and not engaging in other negative behaviours. Litoe and Pumroy found that social (peer) attention is the highest function of disruptive behaviours, this theory very accurately represents the target classroom. Pigott, Fantuzzo and Clement (1986) found in their study that a
GROUP CONTINGENCY

The group contingency token economy would be the most effective form of intervention in a classroom where many off-task behaviours occur.

**Good Behaviour Game (GBG).** Donaldson, Fisher, and Khang (2017) discuss a group contingency called the Good Behaviour Game (GBG). The GBG splits the class into teams, however, it does have set rules and the students gain rewards contingent on following the rules and not violating them. Feedback is given when rule violations occur during the Good Behaviour Game. This group contingency is practical in a classroom environment because collecting data on every single student as opposed to the classroom as a whole is not feasible. This form of group contingency has been proven many times to be effective in reducing disruptive behaviours in the classroom (Donaldson, Fisher & Khang, 2017). Donaldson, Fisher, and Khang compared their study to two others that observed and collected data on individual students during the GBG. Medland and Stachnik (1972) (as cited in Donaldson, Fisher & Khang, 2017) looked at the whole class and individual results and found that the eight students who they observed all showed a great increase in on-task behaviour, an increase was also seen in the whole class. The second study they looked at was based in two classrooms, one with a response cost and one with reinforcement. This study, conducted by Tanol, Johnson, McComas, and Cote (2010) (as cited in Donaldson, Fisher & Khang, 2017) directly observed three students in each class and found that both versions the Good Behaviour Game were successful in reducing disruptive behaviours in all of the students. The authors explain that this system has been proven to work across grades (kindergarten through high school) and it improves behaviour at a whole class level. The success of the GBG supports the use of the current study as it is also a group contingency being used in a classroom.

**Token economy.** Kazdin (1973) completed a study to test the effectiveness of token economies in elementary school classrooms on increasing positive classroom behaviours. The program was implemented across six different classrooms over nine weeks. The teachers in the classrooms were trained in operant conditioning and what sort of intervention techniques to complete in the classroom. Half of the classes were given instructions on what would be happening (i.e. they would get punches on their card if they were engaging in the set rules), and the other half were not given these set instructions. Half of the classes were reinforced contingently based on time; reinforcement was given at six specific times in the morning to all of the students who were displaying on-task behaviour (they received one punch on their card six times per morning). The other half of classes were reinforced noncontingently based on criteria that was unrelated to their performance (i.e. hair colour, gender). These students received reinforcement three separate times for each different category (two punches on their card, three times per morning). The students who were reinforced noncontingently always received six punches in their cards, however the students whose reinforcement was contingent only received a punch if they were on-task at the set times. The results showed that all of the classes showed an improvement in on-task behaviour, but there was a greater increase in the classes that received instruction and contingent reinforcement. Kazdin’s (1973) study proves that the method of giving students instructions and rules to follow, as well as receiving tokens contingent on their positive behaviour is more effective. This method, of using instruction and receiving contingent reinforcers is being utilized in the current study and will increasing on-task behaviour during independent reading.

**Conclusion**

In conclusion, the literature helps to express how all of the combined diagnoses and behavioural difficulties persist when all in one classroom. All of these needs together make for a
very challenging and stressful environment, for not only the teachers, but the students as well. There is plenty of evidence for many of the disorders in the class such as ADHD and ASD as well as the different difficulties faced by the ESL students and how these can affect a classroom. However, even though all of these diagnoses have very different symptoms and effects on individuals, a common theme across the board is reduced ability or functioning when it comes to reading and word comprehension. Both Tamm et al. (2017) and Knight, Blacher and Eisenhower (2018) show that there are proven to be reading deficits in ADHD and ASD respectively. This signifies how important it is to increase on-task behaviour during independent reading, especially at such a crucial time in a child’s development.

There is also evidence to support the fact that remaining on-task directly correlates to achievement, as seen in Slavin’s 1982 study. This, along with evidence in favor of group contingencies and token economies, supports the planned intervention to improve on-task behaviour in the classroom and during independent reading. Litoe and Pumroy’s (1975) support of the effectiveness of group contingencies, combined with Kazdin’s study on the success of his token economy further reinforces the combination of both techniques. By increasing on-task behaviour and reducing disruptions in the classroom, the students with higher needs will receive the support they require from the teacher in the classroom.

This evidence in favor of group contingencies, token economies, and the importance of students remaining on-task supports the hypothesis that; if a token economy with a group contingency was implemented during independent reading, then there would be an increase in on-task behaviour in the classroom.
Chapter III: Methods

Participants

Description of the participants. This study was based in a Grade 4/5 classroom of 26 students, 23 Grade 4 students and three Grade 5 students (11 females and 14 males). Many of the students in the class required extra support. There were multiple specific behavioural needs in the classroom and all of them required extra attention from the teacher. These specific behavioural needs in the classroom were amplified by the fact that many of the students’ academic levels were much lower than grade level. There was a group of 5-7 students who were learning at grade level out of the total 26 students, this was determined through assessments from the school. All of the other students were functioning lower than grade level.

Inclusion criteria. All of the students in the classroom were included in the group contingency. Many of the students in the class could not read, and a few had trouble with basic letter and sound comprehension. Based on the placement student’s direct observations, reading and independent work were areas that needed a great deal of improvement, specifically, independent reading. Each day the students were required to read independently, and every day it was a challenge when getting started and settled in for independent reading. Transitions were another problem area in the classroom, independent reading fell right after first lunch which was a particularly difficult transition for the students. This caused even more problems when independent reading was beginning and during baseline noncompliance was often seen throughout the 15-minutes of independent reading.

Exclusion criteria. The placement student decided that two of the most disruptive students would be excluded from the recording of on-task behaviours. If their behaviours contributed to the classroom’s total, progress would have been very difficult, because they had constant and uncontrollable outbursts. These students were given support through access to technology and frequent breaks when deserved. One more student was excluded from the recording because they were part of the school to community program and were often not in the classroom during independent reading. Finally, the student with ASD who was non-verbal was excluded from recording because of his uncontrollable outbursts such as yelling, noises, walking around, etc.

Consent. This research project received ethical clearance from the Research Ethics Committee for Behavioural Psychology (REC-P) under the authority of the St. Lawrence College Research Ethics Board (SLC-REB), before consent was sent to parents and implementation of the program began. A negative consent form (Appendix A) outlining the intervention goals, procedures, and rationale, as well as the informed consent procedures was sent home with each child, and an email was sent to all of the parents reminding them to look for it. This negative consent form gave parents the option to not respond if they gave consent for their child to participate in this study. Consent was sent home on Friday October 19th, 2018 and parents were given 10 days to respond, it was due back on Monday October 29th, 2018. Every single parent in the classroom consented for their child to be a part of the study; therefore, no changes had to be made to accommodate children who were excluded due to not having consent.

Design

AB Design. The intervention in this study was an AB design with a fixed ratio (FR) schedule. The first phase (phase A) was the baseline phase where no changes were made to behaviour. During baseline, direct observations were made of the students’ on-task behaviour and data was collected based on the rate of on-task seen. The baseline result was 0% on task for the whole week (Appendix B). The second phase (phase B) was the intervention phase.
Intervention was to implement a token economy with a group contingency to increase the on-task behaviour seen in the classroom during independent reading. Since the baseline result was 0% on-task behaviour there was a lot of room for the students to improve.

**Independent/Dependent Variables.** In this study the independent variable was the token economy put in place to increase the students’ on task behaviour. This variable is what was implemented in the class to create a change in the dependent variable. The dependent variable was on-task behaviour. On-task behaviour was dependent on the token economy and how it positively or negatively affected it.

**Data Analysis**

The data was collected daily during the 15 minutes of independent reading. All of this data will be analyzed using graphs and a table expressing the mean, median, PEM and Standard Deviation of. Two graphs and two tables were made to clearly visually analyze the data in the following results section.

**Data Collection and Measures**

**Preference Assessment (11/02/2018).** To assess what reinforcement would be the most effective for the whole class, a preference assessment (Appendix C) was conducted prior to beginning the intervention. The class was given a brief overview of the intervention and what they would be doing to earn the rewards that they were voting on. Every student was given a preference assessment and they were asked to pick their top three favourite items. The preference assessment included items like: stickers, early recess, games etc. All of the items were read out to the students prior to handing out the assessment and each item included a picture prompt to help the students with reading difficulties. The top three reinforcers chosen by the class were tech time (16 votes), candy (14 votes), and listen to music (12 votes). The reinforcers were rotated weekly each time the class reached their goal.

**Baseline assessment of on-task behaviour.** Following the consent procedures, the placement student was able to begin taking baseline data. Baseline data (Appendix B) was taken from Monday October 29th-Friday November 2nd, 2018. Baseline data was collected through direct observation in the classroom. The students were not told they were being observed in order to avoid observer affect during reading. The placement student sat quietly and used both the class timer and their personal stopwatch to keep track of each one-minute interval. Whole-interval recording was used every day during independent reading to record the accelerate behaviour. When the 15-minutes of independent reading began the intervals began. All of the students knew that they all had to be on task for a whole minute to earn a token. On the data collection sheet “X” was used to indicate when the students met the criteria for on-task behaviour. Due to the stability of the baseline data, it was only taken for one week before intervention could begin.

**Goal and Objectives**

The goal of intervention was to increase the students’ on-task behaviour to 26.6% of weekly recorded intervals by the end of intervention as follows:

1. The class will be on-task for 13.3% (10 intervals/tokens) of recorded intervals during independent reading in a week.
2. The class will be on-task for 20% (15 intervals/tokens) of recorded intervals during independent reading in a week.
3. The class will be on-task for 26.6% (20 intervals/tokens) of recorded intervals during independent reading in a week.

Each new goal will be reached when the class can display the previous goal for two consecutive weeks.
Program Procedures and Materials

Setting. Every day the class engaged in independent reading in their regular classroom. The setting remained the same every day, and the students were familiar with the routine. The placement student had a section on the whiteboard (Appendix D) to visually keep track of the students’ tokens during independent reading. This part of the board had visuals along with each of the prizes and a visual for each minute during independent reading.

Materials. The materials used during this study included two token jars, one holding all of the tokens and one holding the tokens that the class received daily. These token jars were under the placement student’s “Independent Reading” section on the white board. This section included two magnetic grids labelled 1-15 for each of the 15 minutes during independent reading. It also had a list of the reinforcers (prizes) with visual prompts drawn next to them. There was a running tally next to the grids of how many tokens the class gained throughout the week, this was cleared every Friday. The placement student also used a clipboard to collect data on a paper copy of the data collection sheet (Appendix E) during independent reading. Two timers were used to keep track of the 15-minutes of reading; one big timer that all of the students could see counting down, and the stopwatch on the placement student’s phone was also used on the clipboard to keep track of each whole interval.

Intervention set-up. Prior to independent reading, the students were all given a preference assessment (November 2nd, 2018) and an oral overview of the procedures and the expected behaviour. After the preference assessment was completed by every student and the placement student tallied the results, the top three reinforcements (“prizes”) were written on the board. When independent reading started on the first day of intervention the students were all reminded of the expectations, how to earn tokens, and of how many tokens they need to earn by the end of the week to earn a prize.

Intervention procedures. After concluding baseline on Friday November 2nd, intervention began on Monday November 5th, 2018. The program was implemented for 15-minutes a day, five days a week, for six weeks. The students were given reminders to stay on-task throughout the 15-minutes of independent reading. The placement student decided that this would be beneficial because, during direct observations it was noted that the class required a lot of redirection and reminders throughout the school day. It was clear that the students would not be able to improve their independent reading skills without verbal prompts and reminders to stay on-task throughout the 15-minutes of reading time. Throughout independent reading the students were given reminders to stay on-task and to try and earn tokens. The students were all made aware of when the 15-minute timer was being set to begin reading quietly, they had a few minutes to find a book and a quiet spot before the timer started. The placement student set their personal stopwatch at the same time as the class timer in order to accurately keep track of the 15 1-minute intervals. The placement student walked around with the stopwatch and a clipboard and watched and listened to make sure all of the students were staying on-task as per the operational definition of on-task behaviour. When there was a disruption from one of the participants, who was not excluded from data collection, an “O” was marked on the data recording sheet (Appendix F) on the clipboard in the corresponding minute/interval to represent off-task behaviour. When there was a minute where all of the students were on-task an “X” was marked to represent on-task behaviour. When the placement student marked an “X,” she would also place a token on the grid in the same minute, so the class was able to keep track of how they were doing. The intervention was a fixed ratio (FR) schedule based on each objective and how many tokens the class was aiming to get each week. After independent reading, the students were
all told how many tokens they had earned; it was tallied on the board for them to see, and the tokens were put into a jar. After this the placement student would take a few minutes to type up the data and find the percentage of on-task behaviour each day.
Chapter IV: Results

Data Analysis of Baseline Results

Table 1 summarizes the data collection results throughout baseline. Daily data collection across the entirety of baseline was 0%. During baseline data collection, there were no instances of on-task behaviour during the 15-minutes of independent reading. This is visually analyzed in Table 1 by looking at the mean, median and standard deviation and seeing that all of them were 0 as well.

Table 1

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<tr>
<th>Statistic</th>
<th>Baseline</th>
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<tbody>
<tr>
<td>Mean</td>
<td>0</td>
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<td>Median</td>
<td>0</td>
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<tr>
<td>Standard Deviation</td>
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Functional Assessments Results

Preference assessment (11/02/2018). Prior to beginning intervention, a preference assessment was given to all of the students to assess what items would be the most successful as reinforcers. Once the student researcher ensured that the students understood the instructions, the students were given time to fill out their individual preference assessments and submit the completed assessments to the placement student. The placement student then assessed all of the forms and compiled the responses to find that the three reinforcers would be Extra Tech Time, Listen to Music, and Candy. The reinforcers chosen by the class all proved very effective at encouraging students to stay on-task. This was assessed through direct observation. Each week when the students reached their goal, the reinforcer was met with enthusiasm from the whole class.

Intervention Results

Visual Analysis. Intervention lasted for six consecutive weeks and started right after baseline was complete and stable. Figure 1 displays the tokens earned each day by the class and there is a clear, visual upwards trend in the number of tokens earned per week. This graph displays the different phases of intervention based on the fixed ratio schedule. The first phase was FR10, the first two weeks of intervention where the objective was to earn 10 tokens. The second phase was FR15 and finally, FR20. The statistical data from Figure 1 is represented in Table 2 to create a clear visual of the analysis. There is an increase in both mean and median from baseline to intervention, and whereas there was no linear trend in baseline, there was an increasing trend during the six weeks of intervention. Although there is a clear upwards trend and increase in on-task behaviour during the six weeks of intervention, the data was never considered to be stable. Figure 2 is another visual analysis depicting the percentage of on-task behaviour each week throughout the six weeks of intervention. This graph was created to put emphasis on the increasing trend seen in the students’ on-task behaviour.

Stability. Data stability was calculated (Appendix G) for each week of intervention. According to Gast and Ledford (2014) data is considered stable when 80-90% of the data points fall within a 25% range of the median. The range is found by calculating 12.5% above and below the median (Gast & Ledford, 2014). Only one week during intervention was considered to be stable (week 2). Stability was also calculated for the entirety of intervention based on the median
found in Table 2. Intervention was found to be not stable as only 27% of the data points fell within the range.

**Percentage of data points exceeding the median.** PEM (Percentage of Data Points Exceeding the Median) was calculated by drawing a horizontal line across the median number during baseline (Table 2) that continued over to the intervention side. The number of data points that exceeded the median were divided by the number of data points during intervention and was then multiplied by 100. Twenty-five of the twenty-six data points exceeded the median therefore there is a PEM of 96.15%. Scruggs and Mastropieri (1998) stated that an intervention is considered to be very effective if the PEM reaches 91% or higher. Therefore, it can be seen that the intervention was very successful at increasing the class’s on-task behaviour during independent reading.

**Summary.** Overall, the intervention shows an increase in on-task behaviour in the Grade 4/5 class during daily, independent reading. The percentage of on-task behaviour increased every week during the six-week intervention as the students reached their weekly goal and obtained reinforcement. After a baseline of 0%, the final week of intervention had an increased on-task percentage of 41.6%. After completing the data stability and PEM calculations, the results of the intervention supported the original hypothesis, as the data showed that a token economy with a group contingency caused a positive and consistent increase in on-task behaviour during independent reading in the classroom.

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<th>Intervention</th>
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<td>Standard Deviation</td>
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<tr>
<td>PEM</td>
<td>0</td>
<td>96.15</td>
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<tr>
<td>Trendline (linear)</td>
<td>No Trend</td>
<td>Increasing Trend</td>
</tr>
</tbody>
</table>

Table 2

*Summary of statistical analysis scores (based on Figure 1)*

*Figure 1.* Daily Recording of On-Task Behaviour During 15-Minutes of Independent Reading Over Baseline and Six Weeks of Intervention.
Goal and Objectives

The results show that the accelerate behaviour of on-task was increased. They also clearly show that all of the objectives were reached, and the class was able to receive their reinforcement each week.

Objective #1. The class will be on-task for 13.3% (10 intervals/tokens) of recorded intervals during independent reading in a week. During the first week of intervention the students were only on-task for a few intervals a day. The only reason that the class reached its first goal of 10 tokens (intervals) was because Friday November 11th was Remembrance Day and all morning they were being told that they had to be quiet and respectful. That day they earned five tokens and it was the exact amount they needed to make up the week; it can be seen visually in Figure 1 that there was a spike on the first Friday of intervention making 10 tokens for the week (13.3% on-task). During the second week of intervention the goal was also met, and the students received their reinforcement for the second time after reaching 11 tokens (18.3% on-task).

Objective #2: The class will be on-task for 20% (15 intervals/tokens) of recorded intervals during independent reading in a week. The third and fourth week of intervention saw quite a spike in on-task behaviour compared to baseline. Week three there were 22 (29.3% on-task) intervals of on-task behaviour observed and in week four there were 20 (33.3% on-task), even though the second goal was only 15. Week four could have reached a higher number of on-task intervals, however, there were only four days of intervention as opposed to five.

Objective #3. The class will be on-task for 26.6% (20 intervals/tokens) of recorded intervals during independent reading in a week. Weeks five and six both only had four days of recording and yet still both reached and exceeded the third goal. During week five the students earned 24 tokens (40% on-task) and during week six they earned 26 (41.6% on-task).

Social Validity. To evaluate the effectiveness of this intervention direct observation was utilized. Both the placement student, and the on-site supervisor (class teacher) used direct observation throughout the entirety of the six-week intervention and discussed and compared
observations. Both the student and supervisor saw a great improvement in the class but agreed that there was still potential for continued improvement. Overall, there was a great degree of agreement among the placement student and the classroom teacher based on the progress seen in the accelerate behaviour.
Chapter V: Discussion

Summary of the Results

The current study which used a token economy with a group contingency, was proved to be an effective intervention for increasing on-task behaviour in a classroom during independent reading. As it was hypothesized, the intervention was successful in increasing on-task behaviour during independent reading. This was seen in the results section which showed that the students were at 41.6% on-task in the last week of intervention, compared to 0% during baseline.

The results that were displayed through visual analysis show an upwards trend in on-task behaviour. There were certain days that created spikes and drops in the general increasing trend. For example, on Friday, November 9th, there was a significantly higher number of tokens received than throughout the rest of the week. This was attributed to the fact that it was the school’s Remembrance Day ceremony and all morning the students were told to be quiet and respectful. Further, there was a decrease on the last day of placement (December 14th) compared to the tokens the students had been receiving that week. It is hypothesized that this could be due to the fact that the classroom routine was inconsistent as it was the researcher’s last day and the students were preparing for Christmas break.

Strengths

Some strengths of the current study include that it provides research in an area of the field which currently has limited research. This study is a great addition to the literature because of the fact that it was successful and is not yet commonly used. The technique of a group contingency has not often been used in classrooms along with a token economy. The good behaviour game was one example of a group contingency in a classroom setting, however, it still divided the classroom into two separate sections (Donaldson, Fisher & Kahng, 2017). There was a number of students in the classroom who had been diagnosed with a variety of disabilities. The fact that the token economy was effective for a variety of students with various support needs was one of its greatest strengths.

Another strength of the current study was the implementation of the intervention by the mediator after the researcher concluded her time in the classroom. Since the intervention had to be so short, there was no time to fade out the intervention. Instead, a plan was put in place for the mediator (class teacher) to continue the intervention on her own. The intervention was modified slightly so that it would be more realistic and simpler for the mediator to use. It was decided that the students would receive a token for the whole day as opposed to one token per interval. They would receive this token if they were deemed well-behaved/on-task overall during independent reading by the classroom teacher. The students would receive their reinforcement at the end of the week if they received three or more tokens during the week.

Limitations

Although the current study was strong in many areas, there were three limitations identified. One limitation of the current study was that negative consent procedures were utilized. Strategies were put in place to ensure that the consent procedure was implemented in the most practical and feasible way possible. The letter sent home with every student, it was also emailed directly to each parent from the school. Another limitation of the current study was that there were a few students who had to be excluded from the data collection. This was due to a high number of uncontrollable outbursts. In total four students were excluded from the study, two presented with many challenging behaviours, one who was nonverbal and had a full-time EA support and one as he did not attend the classroom during independent reading time. This was a limitation as it did not address the challenging, off-task behaviour presented by these four students.
students; or the distractions they presented to other students who were trying to stay on-task. One final limitation was the short timeline of the intervention due to the length of the placement. If there had been more time it was hypothesized that there could have been further increases in on-task behaviour.

**Multilevel Challenges**

**Client.** A challenge that was observed at the client level throughout the duration of this study was the number of negative behaviours and of diagnoses in the classroom. The high number of challenging behaviours in the classroom often made it difficult for the students to focus and made it difficult for the teacher to teach without interruption. Another challenge faced at the client level was the fact that so many of the students in the class were not learning at grade level. Although this was out of the researchers’ control, it did make it very difficult at times to teach lessons to all of the students.

**Program.** This school had many good programs in place to give students the best chance at success. The School to Community program and the sensory room are examples of effective and positive resources in the school. There was also a lot of EA support throughout the school due to the high number of behaviours. One challenge that was faced at the school was the high number of behaviours throughout the school and how even with so much support and so many programs the behaviours often outweighed the support.

**Organization.** The school board as an organization seemed overall to be very well run. One challenge that was noted was that the school was often short-staffed when it came to EA support and there were often substitute teachers. Many days there was no one to fill in and it became an even more challenging environment. This was a challenge because of the high amount of behaviours in the school, it made it very noticeable when the school was short-staffed. It was also difficult for some students to adjust to the inconsistency of staff in the school.

**Society.** One challenge faced at the societal level at this school was stigma and judgement. The school from the current study was known for being a lower income school with high behaviours and a high number of refugees. It was not unheard of for students to be pulled out of the school due to the learning environment. There were a lot of recent changes in Kingston and the school in particular in regard to refugees. The racial stigma surrounding the refugees was observed in the school and the community. Although this was a challenge all of the staff were positive and always had the best interests of the students in mind.

**Contributions to the Behavioural Psychology Field**

There have been many new discoveries in behavioural psychology in recent years. This is the perfect time to continue to expand on the research that backs up these new and different theories. Most importantly, the study is significant to the behavioural psychology field because as found in the literature review, there has been a significant increase in disorders such as ADHD, ASD etc. These are commonly connected with off-task behaviour and this intervention proved to be successful in decreasing these behaviours. The current study makes an important contribution to research, as it simply demonstrates a token economy as an effective intervention for increasing an accelerate behaviour. There is very limited research done on group contingencies within a whole class and this is one more significant way that the current study will help to contribute to the literature. One final and important contribution to the field of behavioural psychology is that it is accessible to a very wide range of students.

**Recommendations for Future Research**

Overall, the success of this study was clear through the results. The study used a token economy with a group contingency to improve on-task behaviour in the classroom and there was
a positive change in the classroom during independent reading. The students were invested in the study and the researcher was involved in the student’s daily progress to achieve their goals.

Although this study was very successful in improving the on-task behaviour of a classroom of students during independent reading, there are still areas of improvement. Future research should implement the intervention for a longer duration. By having a long-term intervention, it would increase the chances of success and give the students more time to grow and practice their independent reading skills as a direct result of further increased on-task behaviour.

Future research should also include a fading procedure. The current study did not have a timeline with enough space to successfully implement a fading procedure. If there was more time for a longer intervention and time to fade out the program, then it would overall be an even more successful intervention. In future research a fading procedure would give the students an easier transition back into their daily reading without the intervention and would help to generalize the behaviour. This ties into the last piece of advice for future researchers, which would be to implement some sort of maintenance and generalization. It would be practical to generalize the positive, on-task behaviours that started during independent reading to the rest of the school day.

During this study, as mentioned above, there was no extra time to further the intervention much. This would include generalizing the behaviour. The behaviour should be generalized and maintained throughout the school day once it has reached a high percentage during reading. This would create a more positive and successful learning environment for all of the students and the teacher.
References


Appendix A: Consent Form

Parent Information Letter and Permission Form

Project Title: The Use of a Group Contingency Token Economy in a 4/5 Grade Classroom to Increase On-Task Behaviour During Independent Reading

Principal Investigator: Heather McILquham (4th year BPSYC student)
Name of Supervisor: Sarah Walmsley
Name of Institution: St. Lawrence College
Name of Agency: Lord Strathcona Public School

Dear Parent(s)/Guardian(s):

The purpose of this letter is to inform you of a research project that will be taking place in your child’s classroom. This letter will provide information about this exciting initiative.

There are many different approaches to managing challenging behaviours in a classroom. There is a lot of evidence to back up the use of token economies and group contingencies on reducing negative behaviour, and in increasing positive interactions between teachers and students. This research project involves an evaluation of a token economy in your child’s classroom. Here are the main research questions we aim to answer:

- Does a token economy help in reducing various disruptive behaviours of children in your child’s classroom?
- Does a token economy result in an increase of on-task behaviour during independent reading time?
- Do negative behaviours decrease over time as a result of a token economy in your child’s classroom?

What is happening in your child’s classroom?

For 15-minutes per day, five days per week, for 4 weeks, (from November 5th to December 14th approximately) your child will be participating in a classroom token economy. This will be implemented during independent reading time. Each time a student(s) engages in one of the behaviours targeted for reduction (e.g. talking out) during one of the 15 minutes then that minute will not count towards their good behaviour. At the end of reading if they have enough full minutes of good behaviour the whole class will receive a reward (to be determined later).

The placement student in your child’s class is the main researcher and implementor of this token economy, she will be recording how well the classroom reacts to the token economy. We will be recording the number of minutes with positive behaviours and how often rewards are given. We will use this information to evaluate the effectiveness of a token economy with a group contingency.
What are the potential benefits and risks to your child?

Many benefits can come from this opportunity. The goal is to increase your child's classrooms appropriate and positive behaviours as a whole. Other benefits include, more time for independent reading and improving reading skills, more one-on-one time with the teacher, and more positive social interactions at school.

There are no known risks to your child from participating in this study. Their daily routine will stay the same, but they will earn more positive feedback and reinforcement from the teachers when appropriate behaviour from the whole class is displayed.

Will the information collected stay private?

No identifying information will be recorded about your child, only a total class number and a gender total with an age range.

The results from the research are part of my thesis and will be made available at the St. Lawrence College library. They may also be published in professional journals or presented at professional conferences, but any such presentations will be of general findings and will never breach individual confidentiality.

This research project has received ethical clearance from the Research Ethics Committee for Behavioural Psychology (REC-P) under the authority of the St. Lawrence College Research Ethics Board (SLC-REB), and from your child's school. The project was developed under the supervision of Sarah Walmsley, my supervisor from St. Lawrence College. I appreciate your cooperation and if you have any additional questions, feel free to ask me, Heather McILquham (HMcILquham14@student.sl.on.ca). You can also contact my College Supervisor, Sarah Walmsley (swalmsley@sl.on.ca or by phone at 613-888-5245). If you have concerns about the way this research is being conducted or about your child's rights as a participant, you may contact the St. Lawrence College Research Ethics Board (SLC-REB) Chair at reb@slc.on.ca.

Does your child have to participate?

Your child's participation is completely voluntary. Should you not wish for your child to participate in this project you may contact me or their teacher to withdraw your consent. Withdrawing consent will not impact your child's regular classroom activities. They will still get the chance to engage in independent reading.

Unless you tell us otherwise, we will understand your silence as consent allowing your child to participate in this exciting research project. If you do not wish for your child to participate in the token economy, you can either contact the placement student, Heather McILquham (HMcILquham14@student.on.sl.ca) or your child's teacher, Katie Shultz (shultzk@limestone.on.ca or by phone 613-549-1680).

Sincerely,
Heather McILquham
4th Year Placement Student
Honours Bachelor of Behavioural Psychology
St. Lawrence College
Baseline Data Recording Independent Reading

Collection Method Used: Whole-interval Recording
Setting: 15 minutes during independent reading
Interval Length: 1 minute

Operational Definition of On-Task: On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task  O=Off-task

Date: Monday October 29th, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 0% (0/15x100=0)

Date: Tuesday October 30th, 2018
Time: 12:15-12:30pm

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Percentage of on-task behaviour: 0% (0/15x100=0)

Date: Wednesday October 31st, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 0% (0/15x100=0)

Date: Thursday November 1st, 2018
Time: 11:30-11:45

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Percentage of on-task behaviour: 0% (0/15x100=0)

Date: Friday November 2nd, 2018
Time: 11:30-11:45

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Percentage of on-task behaviour: 0% (0/15x100=0)
Mean: $0 + 0 + 0 + 0 + 0 = (0/75) \times 100 = 0\%$

Median: $0 \ 0 \ x0 \ 0 \ 0$

Stability:

Step 1: $0 \times 0.125 = 0$
Step 2: $0 + 0 = 0$
Step 3: $0 - 0 = 0$

Range: 0 to 0

All of the data points were within this range ($5/5 \times 100 = 100\%$), therefore since 100% of the data points are within the range the data is considered stable.
## Appendix C: Preference Assessment

### What Do You Like?

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<thead>
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<th>Item</th>
<th>Do You Like It?</th>
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<tbody>
<tr>
<td>Stickers</td>
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<tr>
<td>Candy</td>
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<td>Early Recess</td>
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<td>Circle Games</td>
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<td>Tech Time</td>
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<td>Read Aloud</td>
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<tr>
<td>DPA</td>
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<tr>
<td>Watch a Story</td>
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<tr>
<td>Listen to Music</td>
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Appendix D: Visual Aid on the Class Whiteboard

Tokens earned:

15 mins

Prizes:
- Candy
- Tech time
- Listen to Music

Independent Reading

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Appendix E: Data Recording Sheet

Data Recording of On-Task Behaviour During Independent Reading

**Collection Method Used:** Whole-interval Recording  
**Setting:** 15 minutes during independent reading  
**Interval Length:** 1 minute  
**Operational Definition of On-Task:** On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task    O=Off-task

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<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</td>
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Percentage of on-task behaviour:

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Percentage of on-task behaviour:

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Percentage of on-task behaviour:

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<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15</td>
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Percentage of on-task behaviour:
Mean:

Median:

Stability:

Range:
Appendix F: Raw Data Recording

**Collection Method Used:** Whole-interval Recording

**Setting:** 15 minutes during independent reading

**Interval Length:** 1 minute

**Operational Definition of On-Task:** On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task  O=Off-task

**Date:** Monday November 5\(^{th}\), 2018
**Time:** 11:30-11:45am

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**Percentage of on-task behaviour:** 6.6% (1/15x100=6.6)

**Date:** Tuesday November 6\(^{th}\), 2018
**Time:** 11:30-11:45am

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**Percentage of on-task behaviour:** 13.3% (2/15x100=13.3)

**Date:** Wednesday November 7\(^{th}\), 2018
**Time:** 11:30-11:45am

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**Percentage of on-task behaviour:** 0% (0/15x100=0)

**Date:** Thursday November 8\(^{th}\), 2018
**Time:** 11:30-11:45am

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**Percentage of on-task behaviour:** 13.3% (2/15x100=13.3)

**Date:** Friday November 9\(^{th}\), 2018
**Time:** 11:30-11:45am

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**Percentage of on-task behaviour:** 33.3% (5/15x100=33.3)
Mean: \(1+2+0+2+5 = \frac{10}{75} \times 100 = 13.3\%\)

Median: \(0 \quad 1 \quad x \quad 2 \quad 2 \quad 5\)

Stability:

**Step 1:** \(2 \times 0.125 = 0.25\)

**Step 2:** \(2 + 0.25 = 2.25\)

**Step 3:** \(2 - 0.25 = 1.75\)

Range: 1.75 to 2.25

Two of the data points are within this range \((2/5 \times 100 = 40\%)\), therefore since 40% of the data points are within the range the data is considered not stable.
**Collection Method Used:** Whole-interval Recording  
**Setting:** 15 minutes during independent reading  
**Interval Length:** 1 minute  
**Operational Definition of On-Task:** On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task  O=Off-task

**Date:** Monday November 12\(^{th}\), 2018  
**Time:** 11:30-11:45am  

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Percentage of on-task behaviour: 6.6% (1/15x100=6.6)

**Date:** Tuesday November 13\(^{th}\), 2018  
**Time:** 11:30-11:45am  

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Percentage of on-task behaviour: 26.6% (4/15x100=26.6)

**Date:** Wednesday November 14\(^{th}\), 2018  
**Time:** 11:30-11:45am  

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Percentage of on-task behaviour: 20% (3/15x100=20)

**Date:** Thursday November 15\(^{th}\), 2018  
**Time:** 11:30-11:45am  

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Percentage of on-task behaviour: 20% (3/15x100=20)

**Date:** Friday November 16\(^{th}\), 2018  
**Time:** DATA WAS NOT RECORDED TODAY
Percentage of on-task behaviour:

Mean: $1+4+3+3 = (11/60) \times 100 = 18.3\%$

Median: $1 \ 4 \ (3.5)x \ 3 \ 4$

Stability:

Step 1: $3.5 \times 0.125 = 0.4375$
Step 2: $3.5 + 0.4375 = 3.9375$
Step 3: $3.5 - 0.4275 = 3.0625$

Range: $3.0625$ to $3.9375$

None of the data points are within this range, therefore this week was not considered to be stable.
Collection Method Used: Whole-interval Recording
Setting: 15 minutes during independent reading
Interval Length: 1 minute
Operational Definition of On-Task: On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task     O=Off-task

Date: Monday November 19th, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 26.6% (4/15x100=26.6)

Date: Tuesday November 20th, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 13.3% (2/15x100=13.3)

Date: Wednesday November 21st, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 33.3% (5/15x100=33.3)

Date: Thursday November 22nd, 2018
Time: 12:35-12:50pm

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Percentage of on-task behaviour: 46.6% (7/15x100=46.6)

Date: Friday November 23rd, 2018
Time: 11:35-11:50am

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Percentage of on-task behaviour: 26.6% (4/15x100=26.6)
GROUP CONTINGENCY

Mean: \(4+2+5+7+4= (22/75) \times 100 = 29.3\%\)

Median: 4 2 5x 7 2

Stability:

Step 1: \(5 \times 0.125 = 0.625\)
Step 2: \(5 + 0.625 = 5.625\)
Step 3: \(5 - 0.625 = 4.375\)

Range: 4.375 to 5.525

Only one of the data points is within range \((1/4 \times 100 = 25\%)\), therefore this week of data was considered not stable.
Collection Method Used: Whole-interval Recording
Setting: 15 minutes during independent reading
Interval Length: 1 minute
Operational Definition of On-Task: On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task  O=Off-task

Date: Monday November 26th, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 40% (6/15x100=40%)

Date: Tuesday November 27th, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 33.3% (5/15x100=33.3)

Date: Wednesday November 28th, 2018
Time: 11:30-11:45

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Percentage of on-task behaviour: 26.6% (4/15x100=26.6)

Date: Thursday November 29th, 2018
Time: 11:30-11:45

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Percentage of on-task behaviour: 33.3% (5/15x100=33.3)

Date: Friday November 30th, 2018
Time: NO DATA RECORDED

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Percentage of on-task behaviour:
Mean: $6+5+4+5 = \frac{20}{60} \times 100 = 33.3\%$

Median: 6 5 (4.5)x 4 5

Stability:

Step 1: $4.5 \times 0.125 = 0.5625$
Step 2: $4.5 + 0.5625 = 5.0625$
Step 3: $4.5 - 0.5625 = 3.9375$

Range: 3.9375 to 5.0625

Three out of four data points this week were within the range (3/4x100=75%), therefore this week was not stable.
**Collection Method Used:** Whole-interval Recording  
**Setting:** 15 minutes during independent reading  
**Interval Length:** 1 minute  
**Operational Definition of On-Task:** On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task  
O=Off-task

**Date:** Monday December 3\(^{rd}\), 2018  
**Time:** 11:30-11:45am  

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**Percentage of on-task behaviour:** 26.6% (4/15\times100=26.6)

**Date:** Tuesday December 4\(^{th}\), 2018  
**Time:** 11:30-11:45  

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**Percentage of on-task behaviour:** 26.6% (4/15\times100=26.6)

**Date:** Wednesday December 5\(^{th}\), 2018  
**Time:**  

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**Percentage of on-task behaviour:** 53.3% (8/15\times100=53.3)

**Date:** Thursday December 6\(^{th}\), 2018  
**Time:** 11:30-11:45  

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**Percentage of on-task behaviour:** 53.3% (8/15\times100=53.3)

**Date:** Friday December 7\(^{th}\), 2018  
**Time:** NO DATA COLLECTED  

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**Percentage of on-task behaviour:**
**Mean:** \( 4 + 4 + 8 + 8 = \frac{24}{60} \times 100 = 40\% \)

**Median:** 4 4  (6)x 8 8

**Stability:**

Step 1: 6 \times 0.125 = 0.75
Step 2: 6 + 0.75 = 6.75
Step 3: 6 - 0.75 = 5.25

**Range:** 5.25 to 6.75

None of the data points were within the range, therefore this week was considered to be not stable.
Collection Method Used: Whole-interval Recording
Setting: 15 minutes during independent reading
Interval Length: 1 minute
Operational Definition of On-Task: On-task behaviour is defined as sitting quietly in one spot either in their seat, on the carpet or in a quiet corner, reading one book silently, raising a hand if there is a question pertaining to the book the student is reading.

X=On-task  O=Off-task

Date: Monday December 10th, 2018
Time: NO DATA COLLECTED

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Percentage of on-task behaviour:

Date: Tuesday December 11th, 2018
Time: 11:30-11:45am

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Percentage of on-task behaviour: 40% (6/15x100=40)

Date: Wednesday December 12th, 2018
Time: 11:30-11:45

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Percentage of on-task behaviour: 46.6% (7/15x100=46.6)

Date: Thursday December 13th, 2018
Time: 11:35-11:50

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Percentage of on-task behaviour: 53.3% (8/15x100=53.3)

Date: Friday December 14th, 2018
Time: 11:30-11:45

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Percentage of on-task behaviour: 26.6% (4/15x100=26.6)
Mean: \(6+7+8+4= \frac{25}{60} \times 100 = 41.6\%\)

Median: 6 7 (7.5)x 8 4

Stability:

Step 1: \(7.5 \times 0.125 = 0.9375\)
Step 2: \(7.5 + 0.9375 = 8.4375\)
Step 3: \(7.5 - 0.9375 = 6.5625\)

Range: 6.5625 to 8.4375

Two of the four data points were within the range \(\frac{2}{4} \times 100 = 50\%\), therefore this week was considered not stable.
Appendix G: Visual Analysis of Data Stability Across Intervention

**Week 1:**

**Stability:**

**Step 1:** \(2 \times 0.125 = 0.25\)  
**Step 2:** \(2 + 0.25 = 2.25\)  
**Step 3:** \(2 - 0.25 = 1.75\)

**Range:** 1.75 to 2.25

Two of the data points are within this range \((2/5 \times 100 = 40\%)\), therefore since 40% of the data points are within the range the data is considered not stable.

**Week 2:**

**Stability:**

**Step 1:** \(3.5 \times 0.125 = 0.4375\)  
**Step 2:** \(3.5 + 0.4375 = 3.9375\)  
**Step 3:** \(3.5 - 0.4275 = 3.0625\)

**Range:** 3.0625 to 3.9375

None of the data points are within this range, therefore this week was not considered to be stable.

**Week 3:**

**Stability:**

**Step 1:** \(5 \times 0.125 = 0.625\)  
**Step 2:** \(5 + 0.625 = 5.625\)  
**Step 3:** \(5 - 0.625 = 4.375\)

**Range:** 4.375 to 5.525

Only one of the data points is within range \((1/4 \times 100 = 25\%)\), therefore this week of data was considered not stable.

**Week 4:**
GROUP CONTINGENCY

Stability:

Step 1: 4.5 x 0.125 = 0.5625
Step 2: 4.5 + 0.5625 = 5.0625
Step 3: 4.5 - 0.5625 = 3.9375

Range: 3.9375 to 5.0625

Three out of four data points this week were within the range (3/4 x 100 = 75%), therefore this week was not stable.

Week 5:

Stability:

Step 1: 6 x 0.125 = 0.75
Step 2: 6 + 0.75 = 6.75
Step 3: 6 - 0.75 = 5.25

Range: 5.25 to 6.75

None of the data points were within the range, therefore this week was considered to be unstable.

Week 6:

Stability:

Step 1: 7.5 x 0.125 = 0.9375
Step 2: 7.5 + 0.9375 = 8.4375
Step 3: 7.5 - 0.9375 = 6.5625

Range: 6.5625 to 8.4375

Two of the four data points were within the range (2/4 x 100 = 50%), therefore this week was considered not stable.