Differential Reinforcement of Alternative Behaviours and Social Skills Training to Increase Social Behaviours and Decrease Aggressive Behaviours in a Preschooler with Autism

by

Kateri Massey-Allard

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Canada

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Dedication

To my friends and family who have supported me with my decisions and helped with proofreading (Thank you Jonathan and Abby).

And

To my girlfriend, Emilie Blanchard, who has kept me sane, showed me unconditional love, and supported me through the last year of my degree.
Abstract

The purpose of the following study was to explore the degree to which differential reinforcement of alternative behaviour (DRA) and social skills training (SST) could decrease aggressive behaviours and increase social behaviours in preschoolers with autism spectrum disorder (ASD). A 3.5-year-old male participant with a formal DSM-V diagnosis of ASD took part in the study. The participant demonstrated high levels of aggression towards both adults and peers. A single-subject AB experimental design was used, in which the rates of aggression and social behaviours were collected. The intervention included the combined use of SST and DRA. The findings suggest that the intervention was moderately effective, with the participant displaying an overall increase in his appropriate social behaviours and a decrease in his aggressive behaviours. It was found that peer aggression decreased by 71.6% and aggression toward adults by 47.8% while social behaviours increased to an average of 2.2 occurrences per session. It is recommended that future research be conducted to determine if the effectiveness of a combined SST and DRA intervention demonstrated in this case study could be extended to benefit other preschoolers.
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Differential Reinforcement of Alternative Behaviours and Social Skills Training to Increase Social Behaviours and Decrease Aggressive Behaviours in a Preschooler with Autism

Autism spectrum disorder (ASD) is a commonly occurring, lifelong developmental disorder characterized by communication and social skills deficits as core symptoms (Matson & Adams, 2014). It is one of the most commonly diagnosed childhood disorders. According to The National Autism Association (2015), approximately one in 68 children receive a diagnosis of ASD. Parents usually first become concerned when their child is unable to use words to communicate or when their child develops differently than other children their age (Lord, Cook, Leventhal, & Amaral, 2000). As the child ages, he/she will typically display specific behaviours pertaining to only a subset of the many symptoms associated with ASD. These behavioural symptoms include lack of social skills, aggressive behaviours, and difficulty understanding emotions. Matson and Adams (2014) mention that although no cure has been found to aid children with ASD, early intervention has been shown to greatly improve the symptoms associated with the developmental disability. Such interventions may include behavioural therapy, social skills training, or differential reinforcement.

Aggression and Autism

Despite the limited amount of literature on autism and aggression, recent research has shown that aggression is a commonly co-occurring problem with ASD (Matson & Cervantes, 2014). Aggression in children with ASD is the leading cause of residential placement, which results in fewer occasions for developing independence and forming interpersonal relationships (Farmer, Butter, Mazurek, Cowan, Lainhart, Cook, DeWitt, & Aman, 2015). They also explain that the consequences of aggression include classroom removal, exclusion from agency services, and, in extreme cases, institutionalization. The causes of such disruptive behaviours are thought to be contingent on the lack of social skills and self-control. Additional studies have shown that children with ASD are more at risk to display aggression (Farmer, Butter, Mazurek, Cowan, Lainhart, Cook, DeWitt, & Aman, 2015). Other studies found that younger children with ASD engage in more aggressive behaviours than older ones (Farmer et al., 2015). Researchers originally believed that specific groups of aggressive children existed, with one group displaying primarily reactive aggression and the other group showing mostly proactive aggression (Hubbard, Morrow, Romano, & McAuliffe, 2010). However, they later noticed that most studies suggested that the two subtypes of aggression co-occur, with most aggressive children displaying some level of both reactive and proactive aggression (Hubbard, Morrow, Romano, & McAuliffe, 2010). Thus, it is important to describe the function of children’s aggressive behavior rather than describing aggressive children themselves.

Social Skills and Emotional Control

Social skills are defined as “specific behaviours that result in positive social interactions and encompass both verbal and nonverbal behaviours necessary for effective interpersonal communication” (Rao, Beidel, & Murray, 2007, p. 353). Social skill deficits are a core feature of ASD (Williams White, Keonig, & Scahill, 2006). Children with ASD often exhibit poor eye contact, lack understanding of the emotions of others, and express emotions inappropriately by being aggressive (Mathews, Erkfritz-Gay, Knight, Lancaster, & Kupzyk, 2013). In other words, they lack the behavioural repertoire necessary to interact with peers (Rao, Beidel, & Murray,
2007). Impairment in socialization may increase as children approach adolescence since the social situations become more complex and the child becomes more aware of their lack of social skills (Williams White, Keonig, & Scahill, 2006). This often has a significant impact on their interactions with peers and family and hinders their ability to reach normal developmental milestones (Rao, Beidel, & Murray, 2007).

Research indicates that, for those on the spectrum, the development of emotional regulation is often atypical (Geller, 2005). According to Geller (2005), biological differences in processing speed, incoordination of socially relevant motor actions, delayed perception abilities for faces and nonverbal cues, and sensory overwhelming are common. In addition, many have an inability to recognize emotions or are unable to differentiate distinct emotions (Geller, 2005). These differences lead to impulse control issues, aggression, anxiety, and depression, as proposed by Geller (2005). To prevent the development of these problem behaviours, interventions such as social skills training are justifiably needed early in the child’s development.

Rationale and Purpose

The purpose of the following study was to explore the degree to which differential reinforcement of alternative behaviour (DRA) and social skills training (SST) can increase appropriate social interactions exhibited by children with ASD. This topic is important to examine because of the growing number of children being diagnosed with ASD each year. In addition, many children with ASD lack social skills, which results in high levels of inappropriate social interactions such as aggressive behaviours. In this work, it was hypothesized that a combination of both DRA and social skills training would increase appropriate social interactions and decrease aggressive behaviours. The goal of these techniques was to reliably foster the development of the necessary skills needed in social interactions and mitigating aggressive behaviours resulting in less difficulty in their social life. Thus, by empirically demonstrating that social skills training and DRA can decrease aggressive behaviours and increase social behaviours, children with ASD have a better chance of becoming independent later in life.

Thesis Overview

The chapters included in this thesis are: introduction, literature review, methodology, results, and discussion. The following chapters will discuss the relevant literature as it relates to the effectiveness of social skills training for children with ASD and the role of differential reinforcement of alternative behaviours to help increase appropriate social interactions. The methodology will outline the participants, design, methods, and procedures used to obtain the results, which will be interpreted through a visual analysis. To conclude the thesis, a discussion will identify the strengths and limitations of the study, and the implications for future research.
Chapter 2: Literature Review

Beginning as early as preschool years, childhood aggression can be an important predictor of social difficulties and intellectual disabilities (Arsenio, Cooperman, & Lover, 2000). Research suggests that some occurrences of children’s aggressive behaviour are driven by anger (reactive aggression), whereas other episodes are calm, driven instead by the desire to achieve a goal (proactive aggression) (Hubbard, Morrow, Romano, & McAuliffe, 2010). Matson and Cervantes (2014) mention that proactive aggression is shown to be linked with attention seeking behaviours, especially in children with ASD. Despite a variety of longstanding theories about the connections between emotions, aggression, and social competence, Arsenio, Cooperman, and Lover (2000) notice an important gap in the literature where there is surprisingly little empirical research that has been conducted regarding the relationship between autism and aggression.

Aside from this literature shortcoming, a variety of treatment options for proactive aggression can be found in the literature. Among those are SST and differential reinforcement of alternative behaviour. DRA can be defined as “withholding the reinforcer that is maintaining a problem behavior following its occurrence and providing that reinforcer contingent upon the occurrence of a desired alternative behaviour” (LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010, p. 186). According to Zubizaray and Clair (1998), DRA procedures can be used to reinforce behaviours that are an appropriate alternative to aggressive behaviours. In other words, DRA-based interventions are meant to reduce problem behaviours while simultaneously increasing the replacement behaviour (LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010). A rationale for implementing DRA is that aggressive behaviours are less likely to be exhibited if the alternative behaviour is being performed (Zubicaray & Clair, 1998). DRA can therefore be used as a technique to reinforce desirable actions, such as non-aggressive and sociable behaviours (Zubicaray & Clair, 1998). Other studies, such as the one from Plavnick, Kaid, and MacFarland (2015), suggest that techniques like differential reinforcement, instructions, models, or prompts be used to teach diverse social behaviours.

To maximize the effectiveness of DRA in the context of decreasing aggressive behaviour, the intervention needs to be combined with other techniques such as social skills training. Research has shown a causal connection between poor social skills and behavioural difficulties such as bullying and aggression (Langeveld, Gundersen, & Svardal, 2009). Langeveld, Gundersen, and Svardal (2009) mention that a “lack of social skills has also been found to contribute to behaviour problems in persons with autism and mental disabilities” (p. 1). Social skills training has been implemented to help aggressive children with the basics of prosocial behaviours and social-cognitive skills that they lack and that are necessary for appropriate peer interaction (Pepler, Craig, & Roberts, 1995).

As proposed by Dekker, Nauta, Mulder, Timmerman, and de Bilt (2014), social skills training is among the most common intervention for children diagnosed with ASD. Although social skills training has been empirically proven to be effective for children with autism, social deficits typically tend to persist into adolescence and adulthood unless the skills taught are maintained and generalized throughout a variety of situations and environments (Plavnick, Kaid, & MacFarland, 2015). Wilczynsky, Fisher, Christian, and Logue (2009) propose three recommendations to ensure the generalization and maintenance of the taught social skills: (a) social skills training should be given at an age-appropriate level of intensity within the environment in which the skill must be executed, (b) the teaching method should match the cause of the deficit (skill versus performance), and (c) the intervention should be implemented with
Social Skills Training can also include instructions, modeling, behavioral rehearsal, feedback, and reinforcement (Spence, 2003).

Furthermore, according to Bandura’s cognitive social learning theory, behaviour is learned partly by experiencing the direct consequences of that particular action (Webster-Stratton, 2015). Webster-Stratton (2015) mentions that environmental reinforcers maintain children’s maladaptive behaviors. This is one of the reasons why behavioral training for children with aggressive problems needs to focus on changing the environmental contingencies maintaining the inappropriate behaviors (Webster-Stratton, 2015).

This current study focuses on preschoolers diagnosed with ASD and high levels of aggression toward peers. Social skills training and differential reinforcement will be used to help children reach their full potential in regards to social interactions. Without social skills training, young children diagnosed with ASD have difficulty overcoming their limited social skills later in life, which results in decreased independence. The combined intervention of both social skills training and differential reinforcement is supported by the literature discussed above as effective at increasing appropriate social behaviours and decreasing challenging behaviours versus using a single intervention (i.e., only DRA or SST).

Social Skills Training (SST)

A variety of studies have been conducted to demonstrate the effectiveness of social skills training. Among those is the study from Laugeson, Ellingsen, Sanderson, Ticci, and Bates (2014) who conducted a study with 73 adolescent participants. The participants in the study had a previous diagnosis of autistic disorder, Asperger’s disorder, or pervasive developmental disorder not otherwise specified (PDD-NOS). The study was conducted to determine the effect of a 14-week teacher-facilitated social skills program for students with ASD. The authors found that the program yielded an overall improvement in social responsivensness, social functioning, social motivation, social awareness, social communication, and decreased autistic mannerisms, as reported by the teachers. Furthermore, they noticed that by using teachers as social skills trainers in a classroom environment, the adolescents had a greater chance to obtain social coaching in a natural setting, promoting maintenance over time. In the end, the authors determined that the study demonstrated the effectiveness of SST in increasing social functioning in high-functioning adolescents with ASD.

Another study conducted by Mathews, Erkfritz-Gray, Knight, Lancaster, and Kupzyk (2013) evaluated the effectiveness of group social skills training in children with ASD and disruptive behaviour disorder (DBD). The study consisted of 45 children and adolescents between the ages of 8 and 18 with a formal diagnosis of ASD or DBD. The authors separated the participants into seven experimental groups - three children-only groups (ages 8-11) and four adolescent-only groups (ages 12-16). Each group had to complete an eight-week social skills group therapy program consisting of eight, one-hour sessions (Mathews, Erkfritz-Gray, Knight, Lancaster, & Kupzyk, 2013). The experimenters taught a total of eight appropriate social skills to the participants, consisting of three non-verbal skills (eye contact, facial expressions, and voice tone) and five verbal skills (sharing ideas, complimenting others, offering help, recommending changes, and self-control) (Mathews, Erkfritz-Gray, Knight, Lancaster, & Kupzyk, 2013). Unlike the aforementioned Laugeson, Ellingsen, Sanderson, Ticci, and Bates’ (2014) study, Mathews et al. (2013) explicitly aimed to promote generalization by educating the parents about the skills learned by their child in a particular session, in order to help their child practice at home and/or
with friends. The outcome of the intervention was an increase from baseline on all social skills learned. The authors emphasized that the successful change in behaviour may have occurred not only because of the initial skill prompting and shaping, but also due to their frequent practice and repetition.

An important aspect to notice in this study was the measurement of social validity. In other words, contrary to Laugeson, Ellingsen, Sanderson, Ticci, and Bates’ (2014) study, the intervention was built ensuring that the social significance of the goals, social appropriateness of the procedure, and clinical importance of effects were followed and met (Mathews, Erkfritz-Gray, Knight, Lancaster, & Kupzyk, 2013). However, despite its obvious strengths, it is important to note that the children in the study were diagnosed with either ASD or DBD making the assessment tool and results inconsistent. This means that the results of their studies may be irrelevant and biased.

A meta-analysis executed by Wang, Parrila, and Cui (2013) reviewed and compared a total of 115 studies on the effectiveness of SST. They focused on five specific criteria while conducting their examination. Those included the participants (age, gender, ability, diagnoses), settings/materials, independent variables, dependent variables, and research designs. The overall results suggest that SST can be significantly beneficial for individuals diagnosed with ASD.

Contrary to the above literature research, Bellini, Peters, Benners, and Hopf (2007) found that social skills interventions were minimally effective for children with ASD. Their results come from a quantitative analysis of 55 studies on social skills intervention for children with ASD. They compared the intervention, maintenance, and generalization effects of the studies because of the amount of studies demonstrating low effects within these categories. They found that SST produced low intervention and generalization effects and moderate maintenance across participants, settings, and play stimuli. To conclude their study, they recommended to “increase the dosage of intervention, provide instructions in the child’s natural setting, match the intervention strategy with the type of social deficit, and ensure intervention fidelity” (Bellini, Peters, Benners, & Hopf, 2007, p. 160).

**Differential Reinforcement of Alternative Behaviours (DRA)**

To demonstrate the effectiveness of DRA on reducing the frequency of aggressive behaviours, Lucas (2000) conducted a study with two participants between the ages of two and four years. Throughout the study, DRA was executed by delivering contingent praise when engaging in appropriate behaviours such as cooperative play. Overall, the results of the study suggested that DRA is successful at decreasing the occurrences of aggressive behaviours exhibited per day. Although the results were positive, it is important to notice that the study only lasted ten days and only had two participants. A longer intervention with more participants would be required to obtain statistically significant results.

Similarly to Lucas’ (2000) research, LeGray, Dufrene, Sterling-Turner, Olmi, and Bellone (2010) conducted a study to examine the effect of DRA on decreasing problem behaviours exhibited by three preschool children. The children were referred by their teacher due to repeated occurrences of disruptive behaviours (LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010). During the intervention, a child’s preferred reinforcer was delivered following the first appropriate behaviour after 30 seconds in which the undesirable behaviour did not occur. The reinforcer was taken away once the child engaged in an inappropriate behaviour. A pre-teaching script was read to the child prior to each session. Included in the pre-teaching script was
direct instruction on the target replacement behaviour. The authors believed that pre-teaching would be an important practical aspect to the implementation of the DRA intervention. Overall, the researchers found that the frequency of inappropriate behaviours was significantly decreased in the DRA sessions. However, according to LeGray, Dufrene, Sterling-Turner, Olmi, and Bellone (2010), DRA may have been successful because of the fact that children were less likely to engage in disruptive behaviours when they are exhibiting appropriate behaviours.

Further research by Wright-Gallo, Higbee, Reagon, and Davey (2006) raised important questions and concerns regarding the use of DRA. They conducted a study with two adolescent males who engaged in high rates of disruptive behaviours and chose to use DRA as their intervention procedure. After implementing a functional analysis, they found that the aggression of the participants was caused by either a desire to escape or for attention. The DRA procedure was based upon these results. When participants displayed a disruptive behaviour by demanding escape, the authors removed the instructional materials from the individual for 30-seconds to act as negative reinforcement. On the other hand, if the student requested attention in an appropriate manner, the participant was given a 30-second out of seat break to go speak to either peers or staff members, as a means of positive reinforcement. After analyzing the results, the authors found that DRA was effective in decreasing the frequency of disruptive behaviours. However, they noticed an important practical concern worth reviewing. They mention that sometimes, especially when a break (escape) is used as a reinforcer, that the participant might engage in the alternative behaviour at a rate so high that he avoids all instructions. While this may not be a concern for all cases, they propose to carefully monitor the rates of engagement in the replacement behaviour when using DRA.

Aside from Wright-Gallo, Higbee, Reagon, and Davey’s (2006) research, Machalicek, O’Reilly, Beretvas, Sigafoos, and Lancioni (2006) provided a review of the efficacy of interventions for problem behaviors. The authors reviewed a total of 16 studies to determine the most practical treatment to decrease disruptive behaviors in children with ASD. Some of those studies used differential reinforcement such as DRA as a reinforcement procedure. Their results incorporated a mixture of positive, mixed, and inconclusive findings. The majority of the interventions reviewed reported a decrease in challenging behaviours (85% of studies) (Machalicek, O’Reilly, Beretvas, Sigafoos, & Lancioni, 2006). Furthermore, all of the studies using DRA resulted in a decrease in disruptive behaviours suggesting that DRA can have positive effects on children exhibiting inappropriate behaviours.

In addition to Machalicek, O’Reilly, Beretvas, Sigafoos, and Lancioni’s (2006) meta-analysis, a review analyzing multiple studies on DRA from the past 30 years was conducted by Petscher, Rey, and Bailey (2008). A total of 116 studies were reviewed to determine which topography of behaviour DRA worked best with. According to the authors, most studies used a combination of at least two intervention designs. They also mention that most studies had an emphasis on increasing appropriate communication rather than on decreasing unwanted behaviours. The results of their review suggested that DRA with or without extinction is an effective treatment option to reduce disruptive behaviors in people with developmental disabilities. They conclude by saying that DRA has been shown to be successful in reducing severe disruptive behavior while replacing the unwanted response with an appropriate behavior. To add to their positive findings on DRA, they mention that the intervention “rarely produced unwanted side effects but instead commonly resulted in positive collateral changes” (Petscher, Rey, & Bailey, 2008, p. 420).
Social Skills Training Plus Differential Reinforcement

Despite the limited research on combined interventions such as SST plus DRA, Gillis and Butler (2007) conducted a meta-analysis on social skills intervention specifically related to preschoolers with ASD. Seventeen studies met the inclusion criterion. The analysis of the studies demonstrated that most interventions frequently used modelling (peer, adults, and video modelling), prompting, and/or reinforcement. Their results also suggested that 85% of the studies reported high level of maintenance suggesting that the taught skills will continue over time. Furthermore, generalization was shown in 70% of the included research demonstrating that the skills can be reproduced in new settings, with other individuals, in different situations, and in new activities (Gillis & Butler, 2007). An important aspect of Gillis and Butler’s (2007) meta-analysis is the analysis of the social validity and procedural integrity of the chosen studies. Social validity was defined as “the acceptance of an intervention by consumers (e.g., parents, teacher, etc.) as being socially acceptable. If an intervention is deemed socially acceptable, then it is more likely to be implemented and continued in the home and classroom” (Gillis and Butler, 2007, p. 540). According to their analysis, only 53% of the studies measured social validity. They also determined that 65% of the studies included measures of procedural fidelity.

Aside from the variety of positive reviews, certain limitations are worth mentioning. The main one is the number of studies reviewed in the meta-analysis. Since only 17 studies were analyzed, the authors hypothesized that it may be due to the limited quantity of studies solely including children with ASD who are of preschool age. To help with this limitation, Gillis and Butler (2007) recommend the implementation of additional research regarding intervention for preschoolers with ASD.

Other studies such as the one from Gonzalez-Lopez and Kamps (1997), addressed the use of social skills training and reinforcement to increase social behaviours in young, low-functioning children with a history of behaviour problems. The authors compared the duration and frequency of appropriate social interactions in typical children and those with ASD. A total of 16 children took part in the study - four children with ASD and 12 typical peers from the same elementary school. The participants were between five and seven years old. The intervention consisted of teaching social skills while reinforcing them following appropriate prompted or spontaneous interactions. Gonzalez-Lopez and Kamps (1997) taught the participants a variety of skills including greetings (using names, saying hello, asking questions, and asking friends to play) and asking for help and requesting tangibles (asking peers for help or to give them things they wanted). Following the implementation of their research, they found that, overall, social skills training alone was effective in increasing both the duration and the frequency of social behaviours. However, they noticed that following the social skills training and reinforcement phase, the participants engaged in even longer and more frequently in social interactions than when the social skills were taught alone. The researchers also noticed that the procedure led to a decrease in disruptive behaviours in addition to the increase in social interactions.

Despite the positive effects of Gonzalez-Lopez and Kamps (1997) study, it is important to recognize the date of publication of their research. Since their study was published in 1997, the results may now be outdated, possibly making this information irrelevant. In addition, the results of the intervention did not change the children's behaviour drastically, making it difficult to demonstrate significant effectiveness. The authors proposed the implementation of hypothetical situations to promote the practice of certain behaviors since most social skills are dependent on specific situations. In spite of the above limitations and recommendations, this
research has shown evidence that social skills training and reinforcement can be effective in increasing social interactions and decreasing disruptive behaviors.

**Current Research**

Although limited research is currently available concerning the use of SST and DRA on children diagnosed with ASD of preschool age, the results of the literature review suggest that there is a potential for benefits as a result of the combination of these techniques. The current study examines the effects of the combination of SST and DRA at increasing social interactions and decreasing aggressive behaviour in a preschooler diagnosed with autism. This research provides basic social skills training in initiating and responding to conversation or needs, and offers the necessary skills and support in a natural environment. The intervention will also address other peers through a structured program that provides opportunities to engage in appropriate social interactions. This study includes the involvement of both peers and staff at the agency, in order to lead to a higher rate of practice and promote generalization within the natural environment.
Chapter III: Method

Participant

The participant in this study was a 3.5-year-old boy with a formal DSM-V diagnosis of ASD. Alexander\(^1\) was verbal and used two-word mands to communicate his needs. Alexander lived with his parents and 18-year-old sister and attended a learning centre specializing in teaching children diagnosed with autism using applied behaviour analysis (ABA). Since his admission to the learning centre, Alexander demonstrated high levels of aggression (between 8 and 11 occurrences per day) towards both adults and peers.

**Background information.** Alexander joined a preschool in September 2015 and, upon his admission, immediately began displaying aggression. Staff at his preschool implemented a program to address the issue, which included the instruction of alternative behaviours, such as kissing peers and tapping adults for attention. Following their attempts, Alexander began exhibiting these alternative behaviours in an excessive fashion, which often led to further aggression. Because of his high levels of inappropriate behaviours, Alexander was expelled from the preschool. His parents then enrolled him into the ABA learning centre.

**Consent form procedures.** Information regarding the research project and the potential involvement of the child was sent home via the child’s communication book. In addition to the informed consent form, details including an email address and contact number for any concerns or questions were provided to the parents. The consent form included information about the purpose, intervention procedure, risks, and benefits of the study (Appendix A). The family raised no concerns and the form was obtained from the participant’s caregivers on November 5, 2015. Their right to refuse consent or withdraw from the study was also discussed. It was discussed that withdrawal from the study would not result in any penalty from the agency and that all of the data collected at the time would be destroyed. The student therapist ensured that the informed consent had been signed and reviewed before beginning the intervention. In addition, prior to the implementation of the study, the caregiver was given the opportunity to ask questions to which accurate answers were given. Furthermore, the student therapist received approval from the St. Lawrence Research Ethics Board (REB) to implement the current research study.

**Setting and Materials**

This study was conducted solely at a children’s learning centre. The centre used an interdisciplinary approach in providing intensive behavior intervention (IBI) and applied behaviour analysis (ABA) for the treatment of autism, developmental delays, and childhood learning disorders. In addition, the learning centre has a therapist to child ratio of one-to-one, in order to offer the most beneficial services.

The data collection occurred in multiple rooms within the learning centre and the participant’s therapist supervised the student researcher. To aid with data collection, the student researcher used a stopwatch, writing tools, and data sheets. Reinforcement in the form of edibles was also used during the intervention.

\(^1\)For reasons of confidentiality, all names used in this report are fictional
Operational Definitions

The dependent variables of the study were the frequencies of aggressive and appropriate social behaviours. For the purpose of this study, aggression was divided into two components: aggression toward peers and aggression toward adults. The target behaviours were as followed:

**Aggression toward peers (Decelerate).** Peer aggression will be defined as any type of physical contact directed toward peers with intent to hurt, including pinching, scratching, tapping, pushing, slapping, grabbing, and hair pulling. After an aggressive action directed to a peer is noted, a second occurrence was only recorded if it occurred 60 seconds apart to the same peer. If the participant became aggressive to different peers within the specified timeframe, the behaviour was recorded as multiple distinct occurrences. The behaviour was not recorded if the participant came close to a peer and if he accidently physically encountered a peer (e.g., he was not looking and ran into a peer).

**Aggression toward adults (Decelerate).** This encompasses any type of physical and aggressive behaviors toward adults/staffs. Adult aggression included tapping, slapping, grabbing, kicking, and pinching any adults or staff at the centre. Multiple instances of aggressive actions toward the same adult were only recorded if they occurred 60 seconds apart. If the participant became aggressive to multiple adults within the 60 seconds period, the behaviour was recorded as different occurrences. For the purpose of this study, only aggressive behaviour involving physical contact were recorded while behaviour such as yelling, screaming, crying, or throwing oneself to the floor were ignored.

**Appropriate social behaviors (Accelerate).** Appropriate social behaviours were defined as the ability to demonstrate feelings or to communicate interests and desires to others. Appropriate social skills include both nonverbal and verbal skills such as waving, saying “hi”, “hello”, “look at me”, giving a high-five, or smiling when encountering a peer or adult. Multiple instances of such behaviour were only recorded if they occurred 60 seconds apart to avoid the possibility of scrolling. The behaviour would not be recorded if the participant engaged in inappropriate behaviours toward a peer prior to or following the appropriate social behaviour that included kissing, tapping, pushing, hitting, biting, grabbing, slapping, and hair pulling.

The target behaviours were chosen due to the negative impact of his peer and adult aggression on his social life. In addition, staff agreed that Alexander significantly lacked social skills when interacting with both peers and adults. Both the therapist and the student researcher conducted the sessions in the learning centre and collected data throughout the intervention in order to assess treatment integrity.

Experimental Design

A single-subject AB experimental design was used for the purpose of this study to assess the effectiveness of SST and DRA in decreasing occurrences of peer and adult aggression. The study included 2 phases: a) the baseline phase, in which data on the frequency of aggression were collected and b) the intervention phase, in which rates of aggression and appropriate social behaviours were collected during the treatment. The rationale for using this type of design is to determine individual differences in behaviour before and during the intervention. Since learning will occur, an ABA or ABAB design cannot be implemented.
Measurement and Data Collection

For the purpose of this study, event recording data of peer aggression, adult aggression, and appropriate social behaviours was collected during eight morning and afternoon sessions (9 am - 12 pm or 1 pm - 4 pm) each week for a total of four weeks. Data was recorded for every occurrence of aggression toward peers, aggression toward adults, and appropriate social skills during the observation periods (Appendix B). A functional assessment was conducted between September 17 and October 6 in order to determine the function of peer aggression. Naturalistic observation data (ABC data) was collected (Appendix C) (Portia Learning Centre, 2015) and the participant’s parents completed the Motivation Assessment Scale (MAS) (Appendix D) (Portia Learning Centre, 2015). The results indicated that the function of peer aggression was both tangible and attention from adults while the function of aggression toward adults was mostly attention from staff. A visual analysis of the perceived functions of peer and adult aggression is provided in Figure 1 and 2. The treatment strategies outlined below were implemented based on the results of the above functional assessment.

Throughout the intervention period, data were collected and the student therapist interpreted and analyzed the results with the participant’s therapist and agency supervisor in order to assess the effects of social skills training on the participant’s peer aggression. The student researcher evaluated the effectiveness of SST and DRA on increasing the frequency of appropriate social behaviours and decreasing occurrences of peer and adult aggression in order to assess the effectiveness of the treatment plan.

Assessment Procedures

Functional assessments.

1. Naturalistic observation data recording (ABC data; Appendix C) (September 17 - October 6, 2015)

2. Motivation Assessment Scale (MAS; Appendix D) (September 17 - October 6, 2015)

Baseline assessments.

1. Event recording of frequency of peer aggression (Appendix B) (September 17 - October 18, 2015)

2. Event recording of frequency of adult aggression (Appendix B) (September 17 - October 18, 2015)

3. Event recording of frequency of appropriate social behaviours (Appendix B) (September 17 - October 18, 2015)

Assessment Procedures and Results

Functional assessments.

1. **Naturalistic observation data recording (ABC data).** A direct observation was conducted in the natural setting to determine the function of the aggressive behaviours. An excerpt of the ABC data collected on September 28, 2015 is provided in Appendix C. The antecedents of Alexander’s aggressive behaviours were found to occur when he was around more than one adult or peer and playing with peers or with toys. Following his inappropriate behaviours, the consequences consisted of ignoring him or blocking the peer/adult aggression and redirecting him to more appropriate play. Although the
exact function of the behaviours was unclear, the primary perceived function of his peer and adult aggression seemed to be attention from adults and for tangible (mainly with reinforcing toys/items).

2. *Motivation Assessment Scale (MAS).* A motivational assessment scale (MAS; The Portia Learning Centre, 2015) was sent home with Alexander’s parents in order to gain additional knowledge on the function of his aggressive behaviours. The MAS results demonstrated that aggressive behaviours were more likely to occur when peers were playing with Alexander’s preferred toys/items. It was also noted that the behaviours occurred mostly when in the presence of other peers and adults accompanying him. The results of this assessment provided additional evidence of the functions of Alexander’s behaviours: attention and tangible.

**Baseline assessments.**

1. *Event recording of frequency of peer aggression.* Baseline data of peer aggression was collected during eight weekly sessions (9am - 12pm and/or 1pm - 4pm). Event recording was used to determine the rate of peer aggression for each session. The baseline assessment demonstrated that peer aggression occurred between 8 and 12 times per session (see Figure 3). On average, the behaviour occurred 9.50 times per observation period during the course of the eight days of baseline.

   According to Tawny and Gast (1984), stability is defined as 80%-90% of the data being within a 15% range of the mean of the data collected. Only 50% of the baseline data points were within 15% of the mean, which does not meet the criteria for stability. Although baseline data was not stable, the intervention had to begin due to time constraints.

2. *Event recording of frequency of adult aggression.* Baseline data of adult aggression was collected during eight weekly sessions (9am - 12pm and/or 1pm - 4pm), similarly to peer aggression recording. The baseline assessment demonstrated that adult aggression occurred between two and seven times per session with an average of 4.63 occurrences per observation period (See Figure 3).

   The baseline data collected was not stable, since none of the data points were within 15% of the mean, which does not meet Tawny and Gast’s (1984) criteria.

3. *Event recording of frequency of appropriate social behaviours.* Baseline data of appropriate social behaviours was collected during eight observation periods (9am - 12pm and/or 1pm - 4pm). It was determined that appropriate social behaviours did not occur during the baseline data collection period (See Figure 4).

**Measurement and Data Collection**

For the purpose of this study, event recording data of peer aggression, adult aggression and appropriate social behaviours was collected during eight morning and afternoon sessions (9 am - 12 pm or 1 pm - 4 pm) each week for a total of four weeks. Data was recorded for every occurrence of aggression toward peers, aggression toward adults, and appropriate social skills during the observation periods (Appendix B). A functional assessment was conducted between September 17 and October 6 in order to determine the function of peer aggression. Naturalistic observation data (ABC data) was collected (Appendix C) (Portia Learning Centre, 2015) and the participant’s parents completed the Motivation Assessment Scale (MAS) (Appendix D) (Portia
The results indicated that the function of peer aggression was both tangible and attention from adults while the function of aggression toward adults was mostly attention from staff. A visual analysis of the perceived functions of peer and adult aggression is provided in Figure 1 and 2. The treatment strategies outlined below were implemented based on the results of the above functional assessment.

Throughout the intervention period, data were collected and the student therapist interpreted and analyzed the results with the participant’s therapist and agency supervisor in order to assess the effects of social skills training on the participant’s peer aggression. The student researcher evaluated the effectiveness of SST and DRA on increasing the frequency of appropriate social behaviours and decreasing occurrences of peer and adult aggression in order to assess the effectiveness of the treatment plan.
Figure 1. Visual analysis of the perceived functions of Alexander’s peer aggression collected in the functional assessments.
Figure 2. Visual analysis of the perceived functions of Alexander’s adult aggression collected in the functional assessments.
Program Implementation Procedures

Social skills training. During the first phase, the participant was asked to greet peers and adults with appropriate verbal and nonverbal actions. Each time the participant passed by a peer or adult, he was verbally asked to acknowledge them. Initially, the participant was prompted - verbally and visually - until he was able to perform appropriate greetings independently. Verbal prompts consisted of “We can say hi to our friends!”, “Say hi!”, “High-five”, “Wave”, “Say look at me”, etc. Verbal prompts were initially paired with visual prompts to ensure the effectiveness of fading. Visual prompts consisted of a picture of two children approximately two feet apart greeting and waving to one another. Verbal prompts were systematically faded to visual prompts to avoid the participant being dependent on verbal prompts. Visual prompts were then faded in order for the stimulus of the arrival of a peer or adult triggered a greeting without the need of external prompts.

Differential reinforcement of alternative behaviours. To reduce peer and adult aggression, differential reinforcement of alternative behaviors (DRA) was used. This was implemented by ensuring that every time the therapist or student therapist noticed the participant demonstrating appropriate social skills to a peer or staff, reinforcement was immediately given to the participant. Reinforcement used by the therapists included either edibles (i.e., chocolate) or a privilege (i.e., chasing in big room).

Maintenance and Generalization

During the intervention, the reinforcers were faded to a FR1 to a FI3 followed by a FI5. The treatment program and mediator instructions were provided to the senior and instructional therapists working with the participant to ensure consistency and to ensure the fading procedures were effectively implemented. The treatment plan was placed in the participant’s files, where therapists could easily access the details of the program.
Chapter IV: Results

Aggression toward Peers and Adults

The intervention was implemented over the course of 28 days. Occurrences of Alexander’s peer aggression decreased from an average of 9.5 to 2.7 times per session throughout treatment. According to the data collected, Alexander was aggressive toward peers in a range of 0 to seven times per recording sessions compared to eight to 12 times during baseline (Appendix E). Aggression toward adults decreased to an average of 2.4 occurrences per session compared to the average of 4.63 during baseline. Results indicate that Alexander was aggressive toward staff between 0 and 12 times per sessions compared to two to seven times during baseline.

Standard deviations, means, and medians of Alexander’s aggression toward peers and adults during baseline and intervention are shown in Table 1. The data demonstrates that the average occurrences of peer aggression decreased from 4.6 to 2.1 occurrences per session from the FR1 to FI 3 treatment phase and continued to decrease to one time per session during the FI 5 phase. This suggests that Alexander responded to the DRA and social skills training. After analyzing the results, it was found that Alexander’s behaviour was mostly a function of attention and tangible as stated in the hypothesis.

As shown in Appendix F and Figure 3, the trend of both peer and adult aggression was increasing during baseline, but during the intervention, the trend decreased. The overall downward trend during the intervention highlights the impact DRA and SST had on Alexander’s disruptive behaviours. The variability of the data was also calculated (Table 1) and indicated that there was moderate to high variability during both baseline and intervention. The intervention data did not show stability since only four data points during the intervention were within a 15% range of the mean. In addition, according to Tawney and Gast (1984), if the percentage of overlap between baseline and intervention data points is low, the intervention is said to have a greater effectiveness on the target behaviour. In Appendix E, the effectiveness of the intervention was calculated using the percentage of non-overlapping (PND) data technique. All 28 intervention data points (100.00%) fall below the lowest data point for peer aggression in baseline (Scruggs, Mastropieri, & Casto, 1987). In the case of aggression toward adults, only 13 out of the 28 intervention data point (46.4%) fell below the lowest baseline data point. According to Scruggs, Mastropieri, and Casto (1987), under 50% is considered a questionable intervention. However, the reliability of these data may be low since Alexander had a different therapist at the beginning of the intervention, which may have influenced his behaviour. Nonetheless, it was found that peer aggression decreased by 71.6% and aggression toward adults by 47.8% throughout the intervention, suggesting that the intervention was moderately effective.

Appropriate Social Behaviours

As mentioned above, the intervention was implemented over the course of 28 days. Appropriate social behaviours occurred between 0 and 8 times per session throughout the intervention compared to no occurrences during baseline (Appendix E). Alexander’s appropriate social behaviours increased to an average of 2.2 times per session during intervention compared to an average of zero during baseline.

As shown in Table 1, Alexander’s social behaviours increased from a baseline average of 0 to an average of 4.7 following the last phase. This suggests that structured social skills training
combined with reinforcement increases his social skills, as clearly seen from the trend in Figure 3. The trend showed in Appendix E also supports this. The variability of the data was also calculated (Table 1) and indicated that there was moderate to high variability during both baseline and intervention.

Stability was not found during intervention as only four data points were within 15% range of the mean. The effectiveness of the intervention was also calculated using the percentage of non-overlapping (PND) data technique. It resulted in 22 out of the 28 data points (78.6%) falling above the highest data point for appropriate social behaviours during baseline. This suggests that the intervention was effective in increasing social behaviours (Scruggs, Mastropieri, & Casto, 1987).

Table 1. Statistics on Alexander’s target behaviours during baseline and intervention

<table>
<thead>
<tr>
<th></th>
<th>Peer Aggression</th>
<th>Adult Aggression</th>
<th>Social Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>MEDIAN</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline</td>
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<td>9</td>
<td>1.3</td>
</tr>
<tr>
<td>FR 1</td>
<td>4.6</td>
<td>4.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Fl 3</td>
<td>2.8</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Fl 5</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 3. Baseline and intervention data for Alexander’s peer and adult aggression.
Figure 4. Baseline and intervention data for Alexander's appropriate social behaviours.
Chapter V: Discussion

Summary of Study

This study examined the effects of DRA and social skills training on preschoolers with autism. The combination of DRA and social skills training is an evidence-based approach to substitute unwanted behaviours - aggression toward adults and peers - with appropriate social behaviours. In learning centres for autism and developmental disabilities, opportunities to practice and build social skills with peers are difficult. Therefore, building a program for children with lagging social skills allows them to practice the skills with their teachers and peers.

Research demonstrates significantly lower rates of disruptive behaviour in children with autism when a combined procedure using social skills training and DRA was implemented (Wright-Gallo, Higbee, Reagon, and Davey, 2006). This study attempted to determine if combining two behavioural interventions, such as DRA and social skills training, could have a positive effect on a preschooler's ability to initiate, respond, and engage in social interactions to seek attention and decrease rates of aggressive toward staff and peers.

Interpretation of Results

This study illustrates an effective treatment avenue for children with ASD who engage in aggressive behaviours and who demonstrate minimal functional social skills. The results of this study are consistent with the outcomes of recent studies found in the literature regarding the use of social skills training and DRA to increase social skills and decrease disruptive behaviours.

The SST and DRA procedure appeared to have increased Alexander’s appropriate social behaviours while simultaneously decreasing his aggression. As shown in the functional assessments, Alexander’s behaviours were mainly a function of attention suggesting that his aggression is proactive. This is congruent with the current literature stating that children with autism are more likely to display proactive aggression than neurotypical children (Matson & Cervantes, 2014). Alexander’s successful response to treatment also suggests that a combination of two intervention techniques is effective in decreasing an inappropriate behaviour while simultaneously increasing appropriate behaviours as previously shown in studies such as Gonzalez-Lopez and Kamps’ (1997).

Overall, the participant displayed a significant increase in his appropriate social behaviours and decrease in aggressive behaviours. Similarly, the analyses also suggested an important downward trend in both aggression towards peers and adults with a decrease of 71.6% and 47.8% respectively. Therefore, it can be concluded that the hypothesis for the current study was confirmed. In other words, by increasing his appropriate social interactions with the use of social skills training and DRA, his aggressive behaviours were decreased.

Despite the significance of the analyses, the graphed results of each target behaviour indicated that the frequency of Alexander’s behaviours in the FR1 phase of the intervention only slightly changed compared to baseline. The author hypothesized that this could have been a result of the staff changes and inconsistency in providing the intervention at the start of the treatment. Furthermore, on session 19, Alexander’s aggression toward adults spiked above baseline levels. This was theorized to be the results of an excessive need of attention following eight days of no adult attention from staff unless social skills were used. Alexander’s peer aggression remained above zero at the end of the treatment suggesting that the function could
have been mainly from tangibles used by the directed peer. It was observed that his aggressive behaviours toward peers were elevated when other children played with his preferred toys.

**Limitations**

Several limitations have been identified for the current study. First, throughout the entire study, Alexander was paired with a variety of different staff. During the baseline phase, one of his favorite staff left the agency resulting in a new staff taking her position. Alexander seemed to have reacted to this change by being more aggressive than usual. Furthermore, during the intervention, the student therapist began providing teaching sessions with the child. These changes of staff could have resulted in both an increase and decrease in all three target behaviours. The above also suggests that reactivity could have impacted the results of the study.

Another important limitation is the behaviours that were taught when Alexander was attending preschool. While at preschool, staff taught him behaviours such as kissing peers and tapping adults. However, those behaviours increased his aggressive levels overtime resulting in his expulsion from the school (towards the end of the baseline phase). This change resulted in Alexander attending more sessions at the centre at the beginning of the intervention. This may have resulted in an increase in behaviour. It is however important to note that the increase might also be a result of an extinction burst.

Despite the above limitations, this study sets the occasion to determine if social skills training has the potential to decrease aggression toward peers and adults in preschoolers diagnosed with autism. The positive outcome from this study provides support for the use of social skills training with preschoolers with ASD.

**Multilevel Challenges**

While working with children with ASD and developmental disabilities, many variables that influence the success of the intervention should be taken into account. The success of the treatment plan is broadly contingent on the collaborative approach between the client, program, organization, and society.

On the client level, it is important to note that children with autism are a certain disadvantage since society and the setting they are in, have pre-determined expectations of their success. In addition, the success of any intervention depends on whether staff focus on the child’s weaknesses or strengths. Conducting an intervention focusing on the strengths of the child provides a positive environment for the child. It will also increase his motivation to participate and promote a healthy, rewarding learning environment. If clients lack motivation, the intervention will not become successful and may, in fact, result in an increase in their inappropriate behaviours.

At the program level, behaviour therapists have a challenging task of following the client’s developmental milestones especially since those may be delayed in children with autism. However, the limited time and support offered to staff when trying to build a behavioural strategy makes it difficult to notice the child’s deficits. If the program does not entail everything linked with the problem behaviour, the chances of success decrease drastically.

As for the organization, agencies helping children with developmental disabilities and autism tend to be short staffed and under low resources. Unfortunately, this can lead to issues when implementing a behavioural modification program with children. Furthermore, among the most important factors to have a successful intervention is consistency. If consistency is not
maintained throughout the entire intervention, the treatment’s rate of success decreases. Change of staff and/or lack of staff results in low consistency since new employees might not know or understand the program plan.

At a societal level, children with autism tend to be seen as having a wide range of inappropriate behaviours. They are seen as individuals with decreased functioning and are stereotyped through society. Unfortunately, children with autism are not given the optimal amount of treatment because of the stereotypes and lack of funding.

**Implications for the Behavioural Psychology Field**

Behaviour psychology is an important field in psychology that seeks to aid individuals that they might want and/or need to change unwanted behaviours of others or in some cases, themselves. Understanding the need for social skills training within organizations for children with autism is crucial to ensure their optimal chances for reaching independence. Although difficult to master within a short period of time, children as young as three years of age should and can be given the opportunity to build social skills that may not be in their behavioural repertoire. It is normal for children to have less social skills at such a young age; therefore, social skills training and DRA can be used to promote appropriate behaviours when attempting to communicate needs to others. Furthermore, the use of DRA can be implemented in schools and agencies even if the disruptive behaviours are occurring at a high frequency. Promoting appropriate communication to get people’s attention will set the stage for natural learning as children grow in a variety of different environments.

**Recommendation for Future Research**

Further studies should be conducted to observe and evaluate the effects of DRA and social skills training with a broader sample size across multiple classrooms or learning centres to determine if the findings could be replicated in different setting and with different participants. Because of lack of empirical research on the matter, future research could continue to explore the effectiveness of social skills training and DRA on preschoolers. Since autism is becoming more prominent in our society, interventions need to be conducted at the youngest possible age in order to ensure the most beneficial results. In addition, research should be conducted on participants with different severity of ASD diagnosis to determine which individual may benefit from this particular treatment option. Finally, additional literature could be conducted on children with comorbid disorders that may affect their level of aggression and/or overall response to treatment.
References


Appendices
Appendix A: Consent Form

Project title: Differential Reinforcement of Alternative Behaviours Combined with Social Skills Training to Increase Appropriate Social Behaviours and Decrease Peer and Adult Aggression in a 3 ½ Year Old Boy with Autism

Principal Investigator: Kateri Massey-Allard
Name of supervisor: Pamela Shea
Name of Institution: St. Lawrence College
Name of agency: Portia Learning Centre

Invitation
Your child is being invited to take part in a research study. I am a student in my 4th year of the Behavioural Psychology program at St. Lawrence College. I am currently on placement at the Portia Learning Centre. As a part of this placement, I am completing a research project (called an applied thesis). I would like to ask you for your help to complete this project. The information in this form will help you understand my project and what is expected of your child. Please read the information carefully and ask all the questions you might have before you decide whether or not you would like him to partake in the study.

Why is this research study being done?
My study is on social skills training meant to help increase the frequency of appropriate social behaviours and decrease the number of aggressive behaviours toward peers. I have created a structured program where social skills training will be taught to your child continuously during all three weekly afternoon sessions he will be attending. The social skills training will allow your child to appropriately communicate with his peer without engaging in any type of aggression. This will also help us make sure that this program is successful in the present and future.

What will your son need to do if he takes part?
If you choose to let your son take part in the study, he will be asked to wave and/or say “Hi” to each peer and staff member he will pass during each of the three weekly sessions he will be attending for a total of six weeks. Throughout the sessions, your son will also be prompted to ask for attention from adults (i.e. “Look at me”, “Chase me”). Furthermore, he will be taking part in “turn-taking” sessions with other peers to help communicate his needs with others. The sessions will be held in any room in the agency. During each session, your child will continue to participate in every activity he was previously tasked to.

What are the potential benefits of taking part?
Benefits of taking part in this research study may include a reduction in aggressive behaviours toward peer leading to an increase in social behaviors and interactions with peers. This will then lead to more opportunities for staff to include your child in group and parallel play resulting in additional chances to practice the learned skills.

What are the potential benefits of this research study to others?
The potential benefits of this research study to others will include helping staff being able to keep a safe environment at the learning centre. It will also help other children assimilate to
appropriate social skills when interacting with peers.

**What are the potential disadvantages or risks of taking part?**

Risks from taking part in this research study are minimal but may include non-compliance and a risk that the program will be ineffective.

**What happens if something goes wrong?**

If you notice your child experiencing something negative throughout the research, you may talk to me, my supervisor, or your child’s senior therapist. To prevent negative experiences, only staff that is part of your child’s team will be with your son during the sessions.

**Will my information you collect from me in this project be kept private?**

Any information that identifies your child will be strictly confidential unless required by law. The consent forms will be kept in a locked filing cabinet at the Portia Learning Centre. The data collection sheets and the computer files with the study data will be kept in a password protected file on a secure, password protected computer. The consent form will be kept for 10 years from the participant’s 18th birthday (as per professional clinical psychology guidelines) and the research data will be kept securely for 7 years (as per SLC policy) at the Portia Learning Centre after which they will be destroyed. Your child’s name or other identifiers will not be used on any reports, publications, or presentations resulting from this project.

**Do you have to take part?**

Taking part is voluntary. It is up to you to decide whether or not you want your child to take part in this research project. If you do decide to have them take part, you will be asked to sign this consent form. If you agree with this research project, you are still free to stop at any time, without giving any reason, and without experiencing any penalty, or negative effects. If throughout the study, you decide that you do not want him to participate, please speak to me or my supervisor. You may also request for his data to not be used if you choose to have your son withdrawn from the study. If you decide not to have him them take part in this study, your child can still continue to use the services at the Portia Learning Centre.

**Contact for further information**

This project has been reviewed by the Research Ethics Board at St. Lawrence College. The project will be developed under the supervision of Pamela Shea, my supervisor from St. Lawrence College. I appreciate your cooperation and if you have any additional questions or concerns, feel free to ask me (kmassey-allard16@sl.on.ca ). You can also contact my College Supervisor at pshea@octe.ca or you may also contact the St. Lawrence College Research Ethics Board at reb@sl.on.ca.
Consent

If you agree to have your son take part in this research project, please complete the following form and return it to me as soon as possible. A copy of this signed document will be given to you for your own records. An additional copy of your consent will be retained at the agency.

By signing this form, I agree that:

✓ The study has been explained to me.
✓ All my questions were answered.
✓ Possible harm and discomforts and possible benefits (if any) of this study have been explained to me.
✓ I understand that I have the right not to participate and the right to stop at any time.
✓ I am free now, and in the future, to ask any questions I have about the study.
✓ I have been told that my personal information will be kept confidential.
✓ I understand that no information that would identify me will be released or printed without asking me first.
✓ I understand that the data from this study will be presented at the St. Lawrence College Behavioural Psychology Poster Gala, and may be reported at other conferences or published in a scientific journal. No identifying information will be included in these reports.
✓ I understand that I will receive a signed copy of this consent form.

I hereby consent to have my child take part.


Parent’s Name  Signature of Parent  Date


Student Printed Name  Signature of Student  Date

St. Lawrence College
Appendix B: Baseline Data of Alexander’s Aggression and Social Behaviours

**Pseudonym:** Alexander Challard    **Student:** Kateri Massey-Allard    **Date:** 06/10/15

**Target Behaviours:** Appropriate social behaviours, Peer aggression, and Adult aggression (See operational definitions on page 2 and 3)

<table>
<thead>
<tr>
<th>Session</th>
<th># Peer Aggression</th>
<th># Adult Aggression</th>
<th># Social Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tr>
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</tr>
<tr>
<td>8</td>
<td>8</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix C: Naturalistic Observation Data Recording (ABC data)

**ABC DATA COLLECTION SHEET**

**Pseudonym:** Alexander Challard  
**Student:** Kateri Massey-Allard  
**Date:** 06/10/15

<table>
<thead>
<tr>
<th>TIME</th>
<th>ANTECEDENT</th>
<th>BEHAVIOUR</th>
<th>CONSEQUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:05 pm</td>
<td>Big room playing “chase” with therapist + peer getting edibles close by</td>
<td>Looked at staff + peer aggression</td>
<td>Aggression stopped by therapist</td>
</tr>
<tr>
<td>1:08 pm</td>
<td>Big room playing on blanket with peer on swing</td>
<td>Aggression toward peer on swing + Adult tapping</td>
<td>Aggression stopped by therapist</td>
</tr>
<tr>
<td>1:31 pm</td>
<td>Big room playing “chase” with student therapist + peer on plasma car</td>
<td>Aggression toward peer on plasma car</td>
<td>Aggression stopped by therapist</td>
</tr>
<tr>
<td>1:34 pm</td>
<td>Big room running around</td>
<td>Attempted peer aggression</td>
<td>Aggression prevented by staff</td>
</tr>
<tr>
<td>1:55 pm</td>
<td>Outside playing “hot potato” + demands to pass the ball</td>
<td>Peer aggression (kicking) + Adult Aggression</td>
<td>Aggression stopped by staff</td>
</tr>
<tr>
<td>2:00 pm</td>
<td>Outside playing “ring around the rosie”</td>
<td>Peer aggression</td>
<td>Aggression stopped + removed from group play</td>
</tr>
<tr>
<td>2:55 pm</td>
<td>On carpet + parallel play with 2 peers + farm set</td>
<td>Looked at staff + peer aggression (hair pull)</td>
<td>Aggression stopped</td>
</tr>
<tr>
<td>3:06 pm</td>
<td>Light room + 1 peer sitting on soft chair</td>
<td>Peer aggression (pushing)</td>
<td>Aggression stopped by staff</td>
</tr>
<tr>
<td>3:15 pm</td>
<td>Light room + 2 peers</td>
<td>Peer aggression (hitting, pushing)</td>
<td>Aggression stopped + removed from room</td>
</tr>
</tbody>
</table>
Appendix D: Motivational Assessment Scale (MAS)

MOTIVATION ASSESSMENT SCALE

Pseudonym: Alexander Challard    Rater: Jackie Challard (Mother)    Date: 06/10/15

Description of Behavior (be specific): Peer Aggression

Instructors: The MAS is a questionnaire designed to identify those situations where an individual is likely to behave in specific ways. From this information, more informed decisions can be made about the selections of appropriate replacement behaviors. To complete the MAS, select one behavior of specific interest. Be specific about the behavior. For example “is aggressive” is not as good a description as “hits other people.” Once you have specified the behavior to be rated, read each question carefully and circle the one number that best describes your observations of this behavior.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Never 0</th>
<th>Almost Never 1</th>
<th>Seldom 2</th>
<th>Half the Time 3</th>
<th>Usually 4</th>
<th>Almost Always 5</th>
<th>Always 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Would the behavior occur continuously if this person was left alone for long periods of time?</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Does the behavior occur following a request to perform a difficult task?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Does the behavior seem to occur in response to your talking to other persons in the room/area?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Does the behavior ever occur to get a toy, food, or an activity that this person has been told he/she can’t have?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5. Would the behavior occur repeatedly, in the</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Same way, for long periods of time if the person was alone? (e.g. rocking back and forth for over an hour.)

| 6. Does the behavior occur when any request is made of this person? | X |
| 7. Does the behavior occur whenever you stop attending to this person? | X |
| 8. Does the behavior occur when you take away a favorite food, toy or activity? | X |
| 9. Does it appear to you that the person enjoys doing the behavior? (It feels, tastes, looks, smells, sounds pleasing). | X |
| 10. Does this person seem to do the behavior to upset or annoy you when you are trying to get him/her to do what you ask? | X |
| 11. Does this person seem to do the behavior to upset or annoy you when you are not paying attention to him/her? (e.g. you are in another room or interacting with another person) | X |
| 12. Does the behavior stop occurring shortly after you give the person food, toy, or requested activity? | X |
| 13. When the behavior is occurring does this person | X |
seem calm and unaware of anything else going on around her/him?

14. Does the behavior stop occurring shortly after (one to five minutes) you stop working with or making demands of this person? | X

15. Does this person seem to do the behavior to get you to spend some time with her/him? | X

16. Does the behavior seem to occur when this person has been told that he/she can’t do something he/she had wanted to do? | X

<table>
<thead>
<tr>
<th>Sensory</th>
<th>Escape</th>
<th>Attention</th>
<th>Tangible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 0</td>
<td>2. 2</td>
<td>3. 2</td>
<td>4. 6</td>
</tr>
<tr>
<td>5. 0</td>
<td>6. 2</td>
<td>7. 4</td>
<td>8. 6</td>
</tr>
<tr>
<td>9. 6</td>
<td>10. 2</td>
<td>11. 3</td>
<td>12. 3</td>
</tr>
<tr>
<td>13. 0</td>
<td>14. 1</td>
<td>15. 3</td>
<td>16. 5</td>
</tr>
</tbody>
</table>

Total Score = 6
Mean Score = 1.5
Relative Ranking = 4

Motivation Assessment Scale: Functions for usage

To direct our understanding of the behavior challenge to the intent of the challenge versus the way it appears or makes us feel.

To understand the correlation between the frequency of the challenging behavior and its potential for multiple intents.

To identify those situations in which an individual is likely to behave in certain ways (e.g., requests for change in routine or environment lead to biting).
Outcomes:

To assist in the identification of the motivation(s) of a specified behavior.

To make more informed decisions concerning the selection of appropriate reinforcers and supports for a specified behavior.

Note: Like any assessment tool, the MAS should be used in an on-going continually developing mode.
### Appendix E: Intervention Data of Alexander’s Aggression and Social Behaviours

<table>
<thead>
<tr>
<th>Session</th>
<th>#peer aggression</th>
<th>#adult aggression</th>
<th>#social behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>6</td>
<td>3</td>
<td>1</td>
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<tr>
<td>10</td>
<td>4</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
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<td>3</td>
<td>4</td>
<td>0</td>
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<td>7</td>
<td>1</td>
<td>1</td>
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<tr>
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<td>4</td>
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<tr>
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<td>0</td>
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</tr>
<tr>
<td>36</td>
<td>1</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>
Appendix F: Intervention Mean and Stability for Peer Aggression

TOTAL SESSIONS RECORDED = 28 days

MEAN = 2.7

\[
\text{Stability} = \text{Mean} \times 0.075 \\
= 2.7 \times 0.075 \\
= 0.20 \\
= (2.7 - 0.20) \text{ to } (2.7 + 0.20) \\
= 2.5 \text{ to } 3.0
\]

Stability is within 15\% of the mean level, which is 2.7. Only 4 of the 28 data points are considered stable because the 15\% range is calculated as 7.5\% above and 7.5\% below the mean level. Thus, the intervention data for peer aggression is \textit{not} stable because only 14\% of the data points are within the 15\% mean level.
Appendix G: Intervention Mean and Stability for Aggression toward Adults

**TOTAL SESSIONS RECORDED** = 28 days

**MEAN** = 2.4

\[
\text{Stability} = \text{Mean} \times 0.075
\]

\[
= 2.4 \times 0.075
\]

\[
= 0.18
\]

\[
= (2.4 - 0.18) \text{ to } (2.4 + 0.18)
\]

\[
= 2.22 \text{ to } 2.6
\]

Stability is within 15% of the mean level, which is 2.4. Only 4 of the 28 data points are considered stable because the 15% range is calculated as 7.5% above and 7.5% below the mean level. Thus, the intervention data for peer aggression is not stable because only 14% of the data points are within the 15% mean level.

**TREATMENT EFFECTIVENESS:**

\[
= \frac{(\text{Baseline} - \text{Intervention})}{\text{Baseline}} \times 100\%
\]

\[
= \frac{(4.6 - 2.4)}{4.6} \times 100\%
\]

\[
= 47.8\%
\]
Appendix H: Intervention Mean and Stability for Appropriate Social Behaviours

TOTAL SESSIONS RECORDED = 28 days

MEAN = 2.2

\[ Stability = Mean \times 0.075 \]

\[ = 2.2 \times 0.075 \]

\[ = 0.17 \]

\[ = (2.2 - 0.17) \text{ to } (2.2 + 0.17) \]

\[ = 2.0 \text{ to } 2.4 \]

Stability is within 15% of the mean level, which is 2.7. Only 4 of the 28 data points are considered stable because the 15% range is calculated as 7.5% above and 7.5% below the mean level. Thus, the intervention data for peer aggression is not stable because only 14% of the data points are within the 15% mean level.
Appendix I: Trend Lines of Alexander’s Peer and Adult Aggression
Appendix J: Trend Lines of Alexander’s Social Behaviours