A PEER-MEDIATED INTERVENTION FOR MIDDLE SCHOOL STUDENTS WITH AUTISM SPECTRUM DISORDER

by

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A Peer-Mediated Intervention for Middle School Students with Autism Spectrum Disorder

submitted by Thea Brain in partial fulfillment of the requirements for
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Abstract

Youth with autism spectrum disorder (ASD) are at increased risk for social isolation and loneliness. Although students with ASD are spending more time in inclusive settings at school, research has found that simply placing a student with ASD in physical proximity to typically developing peers is not sufficient to promote social gains. This study used a non-concurrent multiple-baseline, multiple-probe across participants design to investigate the effectiveness of a low-intensity, low-cost peer-mediated intervention (PMI) on social behaviours (engagement and communicative acts) for middle-school aged students with ASD during lunch breaks at school. Nine typically developing peers received less than one hour (40-50 minutes) of peer coach training. Following training, peers were encouraged to interact with their classmate with ASD during lunch breaks at school, using the strategies taught during training. Peer coaches were provided with brief feedback after each probe observation during intervention and praise only during follow-up. Results showed a functional relation between the intervention and both engagement and communicative acts, with three demonstrations of effect across participants. There was some maintenance of effect at 1-4 weeks follow-up. Social validity of this intervention was high for both peer coaches and classroom teachers. In addition, mutual enjoyment was observed for the majority of probe observation sessions across groups. This study contributes to and extends the existing PMI research by including participants between the ages of 11-13 with varying intellectual and social-communication abilities and by delivering the intervention in natural, unstructured school settings. It is important to identify evidence-based interventions that have high social validity from the perspective of school administrators, as interventions that are effective, efficient, and cost-effective are most likely to be adopted by schools.
Lay Summary

Youth with autism spectrum disorder (ASD) are at increased risk for social isolation and loneliness. Although students with ASD are spending more time in inclusive settings at school, research has found that simply placing a student with ASD in physical proximity to typically developing peers is not sufficient to promote social gains. This study provided low-intensity, low-cost peer coach training to interested classmates of students with ASD at an inclusive middle-school. Following training, all three participants with ASD began engaging in activities with peer coaches during lunch breaks. Social communication also increased, with participants with ASD responding more frequently to peer questions and comments during breaks. Peer coaches and classroom teachers reported high satisfaction with the intervention. This study contributes to and extends the existing research by including participants between the ages of 11-13 with varying intellectual and social-communication abilities and by delivering the intervention in natural, unstructured school settings.
Preface

Thea Brain was the co-investigator and author of this study and was primarily responsible for concept formation, data collection, and analysis as well as the manuscript composition. Dr. Pat Mirenda supervised the research supervisor and principal investigator. This project and associated methods were approved by the University of British Columbia’s Research Ethics Board [#H18-00335].
Table of Contents

Abstract ................................................................................................................................................. iii

Lay Summary ........................................................................................................................................ iv

Preface ................................................................................................................................................. v

Table of Contents ................................................................................................................................. vi

List of Tables ......................................................................................................................................... ix

List of Figures ....................................................................................................................................... x

Acknowledgements ................................................................................................................................. xi

Dedication ............................................................................................................................................. xiii

CHAPTER 1: REVIEW OF THE LITERATURE .................................................................................. 1

Background and Introduction .................................................................................................................. 1

What is Friendship? ................................................................................................................................. 2

Friendship and Age ................................................................................................................................. 3

The Benefits of Friendship .................................................................................................................... 4

Autism Spectrum Disorder (ASD) ......................................................................................................... 5

What is ASD? ......................................................................................................................................... 5

ASD and Friends ................................................................................................................................... 6

ASD and Loneliness ............................................................................................................................... 7

Perspectives of Youth with ASD ........................................................................................................... 7
School-Based Interventions to Improve Social Interaction Skills for Children with ASD ........ 9

Peer-Mediated Social Interaction Interventions ................................................................. 10

Purpose of the Study and Research Questions ................................................................. 18

CHAPTER 2: METHOD ........................................................................................................ 20

Recruitment Procedures .................................................................................................. 20

Inclusion and Exclusion Criteria ....................................................................................... 20

Consent Process ............................................................................................................... 21

Participants ....................................................................................................................... 21

Group One /Stuart ........................................................................................................... 22

Group Two/Thomas ......................................................................................................... 22

Group Three/Alexander ................................................................................................... 23

Settings ............................................................................................................................. 24

Measurement .................................................................................................................... 24

Dependent Variables ...................................................................................................... 24

Inter-observer Agreement (IOA) .................................................................................... 26

Implementation Fidelity .................................................................................................... 27

Inter-observer agreement procedures ............................................................................. 30

Research Design .............................................................................................................. 31

Procedures ....................................................................................................................... 32

Pre-Intervention .............................................................................................................. 32

Baseline ............................................................................................................................ 32

Peer Coach Training ....................................................................................................... 33
List of Tables

Table 1. Peer-Mediated Intervention (PMI) Studies with Middle and High School Participants with ASD................................................................. 14

Table 2. Inter-observer agreement data across phases....................................................... 27

Table 3. Peer coach implementation fidelity for intervention and follow-up phases................. 28

Table 4. Implementation fidelity IOA across phases ............................................................. 30

Table 5. Percentage of sessions with mutual enjoyment (peer coach + participant with ASD) during intervention and follow-up phases......................................................... 43

Table 6. Social validity questionnaire: Peer coaches ............................................................ 45

Table 7. Social validity questionnaire: Teachers................................................................. 47
List of Figures

Figure 1. Percentage of 30 second intervals with engagement ........................................... 38

Figure 2. Percentage of 30 second intervals with communicative acts .................................. 41
Acknowledgements

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Thank you to my academic supervisor and mentor, Dr. Pat Mirenda. Her dedication to this field is a true inspiration and I could never adequately express the gratitude I have for her support, guidance and teaching. I hope to make her proud in the work that I do moving forward. If I can accomplish half of what she has done in her career I will consider myself a success. Thank you to all of the brilliant professors and supervisors who have contributed to my education. Thank you to Dr. Richard Stock for being the first to encourage me to go to graduate school and for providing an ethical example to us all. Thank you to Dr. Joseph Lucyshyn and to Dr. Vicki Knight for their careful review, valuable insights and contributions to this manuscript. I would like to acknowledge my classmates and in particular my friend and colleague, Kimberly Kirsch, who has been such a pivotal person in my academic journey and career. Thank you to my
dedicated research assistants, Melanie Lytle and Yvonne Su. They showed up every day to collect data with their running shoes on and smiles on their faces.

I am grateful to the school’s administrative team for agreeing to host this project. Thank you to the classroom teachers and other school staff who were encouraging and patient participants and cheerleaders from the beginning to the end. The students with autism who participated in this study were the inspiration for this study in the first place. I deeply appreciate their participation. I would also like to acknowledge the amazing students who participated as peer coaches in this study. The optimism and dedication that these students brought to the project gave me so much hope. Young people have so much to give and if we can provide them with the right tools and support, there is no limit to what they will accomplish.
This project is dedicated to my mother. She is my role model, my strength and my never-ending source of support.
CHAPTER 1: REVIEW OF THE LITERATURE

Background and Introduction

It is morning break at a local middle school. You can hear laughter, children yelling out scores for basketball, and excited voices calling out to friends. Everywhere you look there are groups of children. There is a group on the playground structure, climbing and chasing each other as they play tag. Another group of children is standing on the field talking, laughing, and occasionally breaking off and whispering in pairs or trios. There is a group playing basketball and a few boys playing a card game while sitting in a circle on the pavement. The playground is full of children playing together, enjoying these moments away from the structure and demand of their classes. However, if you look really closely, you will also notice that there are a few children who don’t seem to be part of any group. There is the boy on the swing being pushed by an adult. Another child is on the very top of the playground structure, observing play from above without joining in. Off to the side sits a boy with his back to his peers, intently digging at the roots of a tree. These children have autism spectrum disorder (ASD).

This is not a unique or unusual scenario. After many years of working in a variety of capacities within the education system, it is an observation that I have made time and time again. Individuals with ASD are often socially isolated. Social isolation at school can take different forms. It may be the child who walks on his toes around the periphery of the school ground during every single break, completely alone. For another child, social isolation means making repeated failed attempts to join the group before being ultimately excluded. Sadly, social isolation is often ignored and, when it is recognized, the consequences may be underestimated. Many adults who teach or care for a with a child with ASD believe that lunch and break times should be breaks from all demands, including social demands. However, it is during these times
that peer relationships are formed and maintained. Peer relationships are of the upmost importance to the well-being and healthy development of all students, including individuals with a diagnosis of ASD.

Everyone needs friends. Research has shown that there are significant social, emotional and academic benefits for children who have positive relationships with peers during both the elementary and secondary school years (e.g., Furrer, Skinner, & Pitzer, 2014; Wentzel, Barry, & Caldwell, 2004). The opposite is also true; children who are socially isolated are at risk for negative outcomes such as decreased classroom engagement, increased school avoidance, and increased risk of both academic difficulties and problem behaviour (Hodges, Boivin, Vitaro, & Bukowski, 1999; Ladd, Kochenderfer, & Coleman, 1996). In fact, in a recent meta-analysis focused on loneliness, researchers found many negative physical and mental health outcomes of this condition, including an increased risk of cardiovascular disease, obesity, high blood pressure, and depression (Masi, Chen, Hawkley, & Cacioppo, 2011). Loneliness occurs when an individual desires social connection but lacks social relationships. Clearly, friends are important.

**What is Friendship?**

Before discussing the specific benefits of friendship in detail, it is important to provide a definition. There are many different definitions of friendship posited in the literature; however, there are some common themes. Researchers often describe reciprocity as a defining feature of quality friendships (e.g., Bukowski, Motzoi, & Meyer, 2009; Vaquera & Kao, 2008). Reciprocity involves a giving and taking between the individuals involved in the relationship, so that they both provide and receive social support (Hartup & Stevens, 1999). In research studies, friendship is often measured through peer nominations wherein nominations are reciprocal (Petrina, Carter, & Stephenson, 2014). Simplistically, we can define friendship as a high level of reciprocated
liking (Bukowski et al., 2009). We can also add observable behaviours to this definition. Newcomb and Bagwell (1995) described friends as individuals who engage in more frequent interactions than non-friends such that, during these interactions there is a higher frequency of affective behaviours such as smiling, looking, laughing, and touching. They argued that it is the quantifiable intensity and frequency of behaviours amongst friends that is the difference between friends and non-friends. Friends like each other, spend more time together, and demonstrate mutual affective behaviours towards one another.

**Friendship and Age**

The ways in which children interact with friends and how friendship is conceptualized changes and becomes increasingly complex as children grow older and transition from concrete to abstract understanding (Rubin, Coplan, Chen, Buskirk, & Wojslawowicz, 2005). For example, in a meta-analysis on friendship, Newcomb and Bagwell (1995) found that in preschool and early elementary grades, typically developing children described their friendships in terms of overt characteristics such as engaging in activities that are of shared interest. As children mature, they continue to put importance on shared interests but they also start to include more abstract concepts such as trust and intimacy. Therefore, the social needs and desires of a typically developing preschool child are significantly different from that of an adolescent (Rubin et al., 2005). In early childhood, children may identify a peer as a friend simply because they had fun playing blocks together that day, and they may be quite satisfied with the quality of that friendship. In later childhood, a level of reciprocity and intimacy over time is typically required before a friendship is considered to be of high quality.
The Benefits of Friendship

While it is difficult to demonstrate functional relations between specific outcomes and having or not having friends, we do know that numerous short- and long-term outcomes are consistently correlated with friendships during childhood and adolescence for typically developing children. A recent review of the literature found that high quality peer relationships were linked to a long list of positive outcomes in school, including higher rates of school engagement and academic performance (Furrer et al., 2014). For example, one study found that kindergarten-aged students with positive peer relations adjusted more quickly and were happier at school in comparison to peers without friends (Ladd et al., 1996). In another study, having friends was positively correlated with higher social and academic success during the major transitions from elementary to middle school and from middle school to high school (Wentzel et al., 2004). Research with high school-aged students found that adolescents with positive friendships reported higher overall life satisfaction and well-being when compared to peers with less successful peer relationships (e.g., Goswami, 2012; Oberle, Schonert-Reichl, & Zumbo, 2011; Proctor, Linley, & Maltby, 2010). In addition, having at least one reciprocal friendship during high school has been linked to achieving higher grades (Vaquera & Kao, 2008).

Friendships with peers provide the context for learning social skills (Hodges et al., 1999). In their meta-analysis of friendship research, Newcomb and Bagwell (1995) found that children gain social competencies through friendships and that the skills developed as a result of childhood friendships impact future relationships. For example, friends sometimes experience conflict and, through these conflicts, children learn to engage in conflict resolution and problem-solving. In addition to providing opportunities to practice social skills, friends support each other through difficult situations and can be a catalyst for the development of self-awareness and self-
esteem (Hodges et al., 1999). As children grow older, they spend less time with family and more time with friends, so peer relationships become increasingly important and influential in the later years of school (Goswami, 2012). It is clear that there are significant benefits to school-aged youth having friends and, given these benefits, it is also clear that there should be a focus on supporting friendships for all students, including those with a diagnosis of ASD.

**Autism Spectrum Disorder (ASD)**

**What is ASD?**

One of the defining characteristics of ASD is a persistent deficit in social communication and social interaction (American Psychiatric Association, 2013). This means that individuals with ASD often have difficulties developing and maintaining relationships. Social-emotional reciprocity is also described as one of the main manifestations of this disorder. As discussed previously, reciprocity has often been identified in the research as one of the key elements of friendships (e.g., Bukowski et al., 2009; Vaquera & Kao, 2008). In addition, individuals with ASD have deficits in verbal and nonverbal communicative behaviours such as engaging in conversation, making eye contact, or responding to and using appropriate facial expressions. Again, it is these types of behaviours that have been discussed in the literature as being important in the formation of friendships (Newcomb & Bagwell, 1995). Given these core deficits, it is clear why individuals with ASD often have a difficult time making and maintaining friendships.

However, just because individuals with ASD struggle with social relationships does not mean that they do not wish to be social. In fact, many individuals with ASD may be socially motivated but lack the skills needed to achieve the social connections that they are looking for (Mazurek, 2014). In the following sections, I provide a brief summary of the research focusing on ASD and friendships as well as ASD and loneliness.
**ASD and Friends**

As summarized in a recent systematic review on ASD and friendship, children with ASD have significantly fewer friends when compared to typically developing peers and peers with other developmental disabilities (Petrina et al., 2014). In one study, only 18% of elementary-aged participants with ASD had a reciprocal friendship (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011). In addition, the participants in this study were found to have a smaller social network and, when they did have friendships, these were of a poorer quality in comparison to their classmates. The available data is clear: the majority of individuals with ASD are unlikely to develop friendships at school without focused intervention in place (Carter, Asmus & Moss, 2013).

Typically developing children acquire social skills through relationships with peers while children with ASD often need explicit instruction in order to acquire these skills (Petrina et al., 2014). So, even when children with ASD do have friends, these interactions are typically not of sufficient quality to promote improvements in the social skills that are core deficits for individuals with ASD. As children with ASD enter adolescence, these difficulties often become more pronounced, and the result is that, in middle school and high school, youth with ASD are even less likely to have friends (e.g., O’Hagan & Hebron, 2017; Rotheram-Fuller, Kasari, Chamberlain, & Locke, 2010). However, although developing and maintaining friendships may be very challenging for youth with ASD, there is research demonstrating that peer relationships are desired by individuals with ASD (O’Hagan & Hebron, 2017).

It is important to note that the majority of the participants in the current body of research on ASD and peer relationships have been individuals with average cognitive ability (Petrina et al., 2014). However, many individuals with ASD also have an intellectual disability (ID), so this
is an under-represented group in the current body of research. There is a need for all levels of intellectual functioning to be represented in future research in order to more fully understand ASD and friendship. For example, in a recent study, participants with ASD and ID were less likely to have friends in comparison to individuals with ID only (Taheri, Perry, & Minnes, 2016). One might hypothesize, based on the available research, that individuals with ASD and ID could have even fewer friends in comparison to individuals with only ASD.

**ASD and Loneliness**

In a review of the literature, Mazurek (2014) found that children with ASD are more likely to experience loneliness in comparison to typically developing children. Loneliness is typically defined as the negative consequence of unfulfilled social needs as experienced by an individual. Therefore, loneliness is a subjective and individual experience. A recent study found that adults with ASD who were lonely were more likely to experience increased depression and anxiety and decreased life satisfaction and self-esteem (Mazurek, 2014). Individuals with ASD who had friends were less likely to be lonely, and these effects were more significant for individuals with a large number of friends in their social network. Mazurek suggested that interventions focusing on decreasing loneliness and increasing the size and quality of social networks for individuals with ASD could have a significant impact on quality of life.

**Perspectives of Youth with ASD**

In a recent systematic review of the literature on ASD and friendship, Petrina et al. (2014) found that individuals with ASD have a difficult time providing a complete definition of friendship. They often described friendship in terms of companionship – having someone to spend time with and perhaps share a mutually preferred activity. In comparison, typically developing individuals were more likely to include other components in their definitions of
friendship, such as loyalty, helpfulness, and intimacy. This less-developed definition of friendship that focuses on companionship is more similar to the definitions of friendship provided by typically developing children in earlier childhood (Newcomb & Bagwell, 1995).

There is a small but growing body of research investigating how youth with ASD perceive the quality of their existing friendships. In two recent studies, most of the participants with ASD reported that they had friends and that they were satisfied with the quality of those friendships (Calder et al., 2013; Petrina, Carter, Stephenson, & Sweller, 2017). Again, many of the participants described their existing friendships in terms of companionship (i.e., having someone to spend time with) rather than describing affection or emotional connection (Calder, Hill & Pellicano, 2013). Given these findings, the authors urged researchers and practitioners to carefully consider the preferences and perceptions of individuals with ASD when implementing social skills interventions. It is possible, for example, that companionship (rather than what we often think of as “friendship”) fulfills the social needs of some individuals with ASD.

While it is certainly encouraging that some individuals with ASD are satisfied in their relationships with peers, other research has found that adolescents with ASD report dissatisfaction with their friendships (O’Hagan & Hebron, 2017). It is also important to note that, as is the case with the majority of research on friendship and ASD in general, participants in these studies either had typical intellectual ability or a mild intellectual disability (Calder et al., 2013; O’Hagan & Hebron, 2017; Petrina et al., 2017). It is uncertain how generalizable any of the conclusions may be for the wide spectrum of individuals with ASD, including those with a significant ID. There is certainly a need for future research investigating the perspectives of individuals with ASD, including those who have an ID, in order to gain a more complete picture of how individuals with ASD perceive their own friendships and how they experience loneliness.
In summary, individuals with ASD are more likely to be socially isolated, lack friends and experience loneliness. Loneliness occurs when social needs are unfulfilled; however, social needs are highly individualized. One person may desire reciprocal relationships with a large group of peers while another may have his or her needs met through one significant peer relationship. There is evidence that some individuals with ASD may have a qualitatively different definition of friendship and that their social needs may sometimes be met through companionship with peers. Thus, when we provide intervention for a youth with ASD who does not have any friends, reciprocal friendships may be the ultimate goal. However, a socially valid first intervention goal may be to increase peer engagement. In other words, an appropriate and important first step might be to support the development of a companionship relationship between an individual with ASD and one or more typically developing peers. Companionship with peers may begin to reduce experiences of loneliness and have a positive impact on quality of life for individuals with ASD.

School-Based Interventions to Improve Social Interaction Skills for Children with ASD

Students with ASD are spending an increasing proportion of their school day in inclusive settings; unfortunately, research has found that simply placing a student with ASD in physical proximity to typically developing peers is not sufficient to promote social gains (Ferraioli & Harris, 2011). Systematic interventions are typically required to increase the social interactions of children with ASD. In a recent review, authors found that social skills interventions utilizing components of applied behaviour analysis (ABA) as teaching strategies met criteria for an evidence-based practice when used to improve social interactions of children with ASD (Camargo, Rispoli, Ganz, Hong, Davis, & Mason, 2014). Examples of behaviorally-based interventions include video modeling, social stories, prompting, and reinforcement. Interventions
that were mediated by peers were the most common in the literature and typically trained peers were often trained to implement interventions rooted in ABA (e.g., using prompting and positive reinforcement).

**Peer-Mediated Social Interaction Interventions**

Peer-mediated interventions (PMI) have been used to support individuals with disabilities in a variety of inclusive settings (e.g., classrooms, playgrounds) with a number of target behaviours (e.g., social interaction, academic engagement). PMI focuses on training typically-developing peers to support a peer with a disability and there is a growing body of research demonstrating the effectiveness of this approach, particularly in school settings (Bene, Banda, & Brown, 2014; Chang & Locke, 2016; Watkins et al., 2015). Training peers how to interact with a classmate who has ASD is a socially-valid, practical, and cost-effective approach for social skills development in a school setting (Boudreau, Corkum, Meko & Smith, 2015; Chan, Rispoli, O’Reilly, Sigafoos, & Cole, 2009). PMI is well-suited for use in school settings as it can be incorporated into natural routines within the classroom or other environments in the school (e.g., playground, cafeteria, library). When peers are trained as intervention agents, there may be increased intervention access for students with ASD in comparison to interventions that are adult-led (Watkins et al., 2015). PMI reduces demands on school staff and potentially promotes generalization of skills across peers and settings. The majority of practitioners, students with ASD, and typically developing peers who have participated in PMI research have reported high levels of satisfaction with the intervention.

**Reviews of the PMI Literature.** Three major reviews have summarized and evaluated the existing PMI research (Chan et al., 2009; Chang & Locke, 2016; Watkins et al., 2015). In 2009, Chan and colleagues found 42 PMI studies that met their inclusion criteria. The studies
included in this review had a wide range of dependent variables including academic skills and reduction of disruptive behaviours as well as social skills. Chang and Locke (2016) evaluated PMI research that utilized group designs. They focused on studies with social interaction goals for students with ASD and found a total of five studies. Watkins and colleagues (2015) found 14 PMI studies published after the Chan et al. review (2009) that met their inclusion criteria. The focus of this review was to evaluate the effectiveness of PMI as an intervention to improve social interaction skills of students with ASD in inclusive settings. All three reviews concluded that PMI is a promising intervention for individuals with ASD and encouraged ongoing research.

The authors of these reviews made a number of recommendations for future research, including the need to include more diverse participants in terms of age and cognitive ability (Chan et al., 2009; Chang, & Locke, 2016; Watkins et al., 2015). In particular, they noted a general lack of research evaluating the effectiveness of PMI interventions with older students in middle or high school. It is not surprising that the authors highlighted this specific gap in the research. In total, only 11 out of 60 studies across these three reviews (approximately 18%), included participants who were 11 years old or older (middle or high-school aged). In addition, the majority of the participants did not have an intellectual disability and were often noted to be “high-functioning” (see Watkins et al., 2015). It is important that research reflect the wide spectrum of ASD, as it cannot be assumed that an intervention that is effective with preschool or elementary-aged children with ASD will be effective with adolescents; nor can it be assumed that an intervention that is effective with individuals who do not have an intellectual disability will have the same effect for youth who do have an intellectual disability.

**Recent PMI Research.** Since the publication of these reviews, a number of researchers have continued with PMI research with the aim of extending the work to include students of
different ages and intellectual abilities. For example, researchers recently used a randomized controlled design to evaluate PMI for adolescents with severe disabilities (Carter et al., 2016). They found that the group participating in PMI made significant gains with social-related goals including interactions with peers, whereas participants who received more standard adult-support made only modest gains in these goal areas.

In order to evaluate the existing body of PMI research for middle and high-school aged youth with ASD, I created a table summarizing the current literature. Studies were included in this table if they met the following criteria: 1) participants were aged 11 or older, 2) the intervention took place in an inclusive school setting, 3) specific peer training was provided (i.e., proximity-only interventions were not included), and 4) social interaction was a dependent variable. Table 1 summarizes the studies included in this review.

Nine studies met the inclusion criteria, with three of the nine studies published after 2015. Seven out of the nine studies included participants with ASD and an intellectual disability. Four out of the nine studies took place in a classroom setting and five occurred during unstructured social times (e.g., the transition between classes or lunch period). All of the studies found that PMI was an effective intervention for increasing social interaction skills for youth with ASD, adding to the evidence base for PMI. However, there remains a need to continue adding to this research to better understand how PMI can be most effective for adolescents with ASD of varying cognitive ability in a variety of natural settings at school.

As seen in Table 1, the structure and content of peer training has varied considerably across PMI research. For example, in one study, peers received only 10 minutes of training immediately prior to a social interaction with a participant (Hughes, Golas, Cosgriff, Brigham, Edwards & Cashen, 2011), while in another study, peers received six 40-minute training sessions.
and six 40-minute follow-up sessions (Schmidt & Stichter, 2012). Interestingly, all of the PMI studies – regardless of the length and content of peer raining -- found that the intervention had a significant effect on social interaction skill. If the goal is to increase evidence-based interventions for students with ASD in schools, it is important to identify cost-effective, efficient and effective interventions that can be easily adopted by school teams. Additional research examining the effectiveness of low-intensity, low-cost PMI is needed in order to train peers most efficiently and maximize the social validity of PMI from the perspective of school administrators.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Participants (age/diagnosis)</th>
<th>TD Peers (age/diagnosis)</th>
<th>Research Design</th>
<th>Intervention setting</th>
<th>Peer Training/Intervention</th>
<th>Participant with ASD Training</th>
<th>Social Interaction Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bambara, Cole, Kunsch, Tsai &amp; Ayad, 2016</td>
<td>3 participants; age 14-15; ASD or ASD + ID</td>
<td>9 peers; age 16-18; availability; expressed interest</td>
<td>SSRD</td>
<td>Cafeteria, during lunch</td>
<td>30-min group network training sessions; peers taught: strategies to support/promote conversation, initiations and follow-up questions; training included: rationale, description, modeling, guided practice with examples and non-examples and roleplay; feedback also provided for 5 min prior to each lunch observation; cue cards with summary of strategies and communication goals on lunch table for review</td>
<td>30-min training prior to lunch period; participant with ASD trained using direct instruction and role play to use written text cue cards to initiate conversation and ask follow-up questions</td>
<td>Conversational acts (prompted and unprompted) increased substantially for all participants and maintained during the post-training condition. Initiations and follow-up questions (prompted and unprompted) increased substantially after peers trained to promote initiations and follow-up questions as well as the addition of text cue cards with topics</td>
</tr>
<tr>
<td>Carter, Cushing, Clark &amp; Kennedy, 2005</td>
<td>2 participants; age 12,13; ASD; moderate ID</td>
<td>2-6 peers; age 11-14; average students</td>
<td>SSRD</td>
<td>Science classroom</td>
<td>2-4 days; ongoing monitoring, feedback and modeling by staff; peers trained to initiate interactions, prompt communication, give feedback, academic support</td>
<td>None</td>
<td>Higher rates of social interaction for both participants when there were 2 peers versus 1 peer. No change in quality of interactions for 1 peer or 2</td>
</tr>
<tr>
<td>Authors</td>
<td>Participants (age/diagnosis)</td>
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<tr>
<td>Carter et al., 2016</td>
<td>51 participants (48 participants in comparison group); grades 9-12; ASD or ASD + ID</td>
<td>106 peers; grades 9-12</td>
<td>GD</td>
<td>Classroom</td>
<td>Average 34-min initial training; provided with: rationale for peer support strategies, background of participant, general goals for increasing interactions, guidelines for confidentiality/respectful language, expectations for classroom, support strategies and guidance for seeking assistance; coaches provided modeling of strategies; peers trained to: support academics, socialize, self-monitor</td>
<td>None</td>
<td>Social interactions and number of friendships increased significantly in comparison to control group. Some maintenance of interactions with peer partners and friendships at 1 year</td>
</tr>
<tr>
<td>Carter et al., 2017</td>
<td>4 participants; age 16-19; ASD or Asperger’s; no ID</td>
<td>13 peers; grades 9-12; strong social skills; interest/willingness to participate</td>
<td>SSRD</td>
<td>Classroom</td>
<td>Formal orientation/training session: rationale for peer support strategies; background of participant; general goals of increasing interaction with peers etc.; confidentiality/respectful language; expectations specific to classroom; support strategies; guidance for seeking assistance; peers trained in supports specific to participant: e.g., to converse with participant, prompt interactions with other peers and reinforce social attempts</td>
<td>None</td>
<td>Social interactions increased for all participants during intervention; limited improvements in initiations</td>
</tr>
<tr>
<td>Haring &amp; Breen, 1992</td>
<td>1 participant; age 13; ASD; ID</td>
<td>4 peers; common interest with participant; average/honor students</td>
<td>SSRD</td>
<td>Transition period between lunch, lunch period;</td>
<td>30-min peer network meetings 1x/week led by facilitator; peers trained to: initiate interactions during scheduled times of day;</td>
<td>Participant with ASD trained to: respond appropriately to social initiations;</td>
<td>Frequency of social interactions, total number of multiple-turn interactions and</td>
</tr>
<tr>
<td>Authors</td>
<td>Participants (age/diagnosis)</td>
<td>TD Peers</td>
<td>Research Design</td>
<td>Intervention setting</td>
<td>Peer Training/Intervention</td>
<td>Participant with ASD Training</td>
<td>Social Interaction Outcomes</td>
</tr>
<tr>
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</tr>
<tr>
<td>Hochman, Carter, Bottema-Beutel, Harvey &amp; Gustafson, 2015</td>
<td>4 participants; age 15-17; ASD + ID</td>
<td>11 peers; 16-18; dependable; part of an existing network of friends; interest in students with disabilities or appropriate social skills</td>
<td>SSRD</td>
<td>Cafeteria during lunch</td>
<td>Orientation meeting: learn about one another, discuss goals, share ideas for increasing interactions, determine when and where interactions could occur, confidentiality, activities and scheduling, social-related goal for participant introduced and strategies modeled by facilitator; weekly network meetings scheduled for 30-min during lunch, participant with ASD and peers sat together and participated in a shared activity; peers taught to: initiate conversation, prompt interactions and model appropriate social skills</td>
<td>None</td>
<td>Social interactions and engagement with peers increased substantially for all participants; gains did not generalize for 3 participants on days without peer network meetings; modest improvement for 3 participants on their social-related goal, substantial gains for 1 participant</td>
</tr>
<tr>
<td>Hughes et al., 2011</td>
<td>3 participants; age 16-21; ASD; ID</td>
<td>39 high school students; recommended by teachers; expressed interest; enrollment in same class/lunch period</td>
<td>SSRD</td>
<td>Cafeteria during lunch &amp; general education classrooms during non-academic times; natural class routines</td>
<td>Informal training immediately prior to interaction using description and modeling; peers trained to: use communication book; prompt; add to conversation and provide positive reinforcement</td>
<td>Average 10-min training; Participant with ASD trained to: use communication book to initiate</td>
<td>Increase in interactions, responding and initiations increased for all participants across settings, maintenance at 4 and 6 months</td>
</tr>
<tr>
<td>Authors</td>
<td>Participants (age/diagnosis)</td>
<td>TD Peers</td>
<td>Research Design</td>
<td>Intervention setting</td>
<td>Peer Training/Intervention</td>
<td>Participant with ASD Training</td>
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</tr>
<tr>
<td>------------------------</td>
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<td>----------------------------</td>
</tr>
<tr>
<td>Hughes et al., 2013</td>
<td>3 participants; age 16-17; ASD; ID</td>
<td>3 participants; grade 10-12; recommended by teacher; shared class with participant; expressed interest; verbal agreement to track interactions</td>
<td>SSRD</td>
<td>Classroom</td>
<td>1 20-min training session; peers provided with information about participant with ASD, e.g., how they communicate and personal interests; peers trained to: select an interaction goal and track number of interactions with participant daily</td>
<td>None</td>
<td>Frequency of peer initiations to participant with ASD and duration of interactions increased to normative ranges for all participants across settings</td>
</tr>
<tr>
<td>Schmidt &amp; Stichter, 2012</td>
<td>3 participants; age 12; PDD; no ID</td>
<td>3 peers; age 12-13; willingness to participate; good attendance record; compliant with instructions; ability to make up any missed schoolwork; appropriate peer interactions; followed through with assigned tasks.</td>
<td>SSRD</td>
<td>Lunch time at a lunch table; math in classroom</td>
<td>40-min, 1x/week for 6 weeks; followed by six 40-min check-up sessions; peers trained using skill instruction, adult modeling, skill rehearsal, feedback and system of reinforcement; given overview of SCI-A program (see Stichter and colleagues, 2010); peers trained to: initiate interactions with participants by gaining attention, initiating conversation using conversation starters, adding comments, responding to participants</td>
<td>None</td>
<td>Increased durations of social behaviour (initiations, responses, continuations) for all participants during peer mediated intervention (both initiation and proximity only phases) in comparison to social competence program alone</td>
</tr>
</tbody>
</table>

KEY: ID: intellectual disability; ASD: autism spectrum disorder; PDD: pervasive developmental disability; TD: typically developing; SSRD: single subject research design; GD: group design
Purpose of the Study and Research Questions

The purpose of this study was to examine the effectiveness of a low-intensity intervention for middle-school aged students with ASD. Inclusion criteria allowed for participants with a range of cognitive ability and social-communication abilities. In addition, the intervention occurred during lunch breaks rather than during structured classroom times. For many middle-school aged students with ASD, lunch breaks do not involve interaction with their peers. There is often lower adult support during these times and school teams may believe that this is a time to allow students a respite from demands. Arguably, however, break times are ideal times to implement PMI as these are times when students do the majority of their socializing. In addition, interventions taking place during breaks can be primarily focused on social interactions, rather than needing to navigate both academic and social goals.

The research questions in the study were as follows:

1. Primary question: Is there a functional relation between a low-intensity, low-cost peer-mediated intervention (PMI) and increased social behaviour (percentage of peer engagement and percentage of communicative acts) of middle-school aged youth with autism spectrum disorder (ASD) during break and lunch periods on the playground and in the cafeteria?

   Hypothesis: I hypothesize that there will be an increase in peer engagement and communicative acts as a result of the PMI intervention for youth with ASD during break and lunch at school.

2. Secondary questions
   a. To what extent are changes in peer interaction maintained at 1-4 week follow-up?
Hypothesis: Changes will be maintained overall, but at a lower level than immediately post-intervention.

b. How do peers and school staff rate the social validity of the PMI intervention?

Hypothesis: Peers and school staff will endorse the social validity of the intervention.

c. Will indicator behaviours indicating mutual enjoyment (i.e., shared eye contact, smiling, laughing) be evident for peer coaches and participants with ASD when engaging in activities together during lunch breaks?

Hypothesis: There will be observable behaviours indicating mutual enjoyment during observations.
CHAPTER 2: METHOD

Recruitment Procedures

Recruitment of participants began following ethics approval from the UBC Office of Research Services. The project was approved by the administrative team of a private school in the Greater Vancouver Area of British Columbia.

Inclusion and Exclusion Criteria

Three groups of participants were involved in this study: classroom teachers, students with autism spectrum disorder (ASD), and peer coaches. Each participant with ASD was paired with 2-4 peer coaches who were members of their respective classrooms at an inclusive middle school. Inclusion criteria for classroom teachers and participants with ASD were provided to the Education Support Services (ESS) Coordinator. Inclusion criteria for peer coaches were provided to the classroom teachers of students with ASD whose parents consented to their participation.

Classroom teachers. Classroom teachers were identified by the ESS Coordinator because a student with ASD who met study criteria was a member of their class. There were no other criterion for classroom teachers.

Students with ASD. Inclusion criteria for students with ASD were as follows: (a) ages 11-15; (b) diagnosed with ASD through an independent assessment by an experienced multidisciplinary team; (c) required an adapted or modified curricular program delivered in an inclusive setting; (d) low engagement with peers at school; and (e) social-communication goals identified on an individualized education plan (IEP). Students were excluded if they had a history of significant problem behaviour that might interfere with participation due to safety concerns.

Peer coaches. Peer coaches were members of the same classroom as a student with ASD.
They were nominated by their classroom teachers based on the following criteria: (a) willing volunteers who had previously expressed interest in interacting with their classmate with ASD; and (b) strong social skills. Exclusion criteria included (a) a history of significant problem behaviour that might interfere with participation due to safety concerns and/or (b) their teachers’ perception that participation might be disruptive to their own academic or social functioning at school.

**Consent Process**

The ESS Coordinator first sent invitation letters to the teachers of students with ASD who met the criterion described previously. Interested teachers were asked to contact the researcher for additional information. Consent was obtained for three teachers, who then sent invitation letters to the parent or guardian of the student with ASD in their classroom. Parents of all three participants consented to participation on behalf of their children, who were unable to provide assent because of limitations in language comprehension. Classroom teachers were then provided with peer coach inclusion and exclusion criteria and were asked to nominate 2-4 peer coaches. They provided invitation letters to parents and guardians of the nominated peers, and parents were asked to email the researchers for more information. Nine peer coaches were nominated and all nine provided consent and assent to participate.

**Participants**

Three groups of participants in three different classrooms were involved in the study. Each group consisted of a classroom teacher, one student with ASD, and 2-4 peer coaches. The groups are described in the sections that follow; all names are pseudonyms.
**Group One /Stuart**

Group one included a grade 6 classroom teacher; Stuart, a student with ASD; and two peer coaches. Both peer coaches were 11-year-old students, one girl and one boy.

**Stuart.** Stuart was a 12-year old boy who was on a modified program across all grade 6 subjects. He participated in most class activities with support from a full-time 1:1 educational assistant (EA). He communicated verbally and was able to make a variety of requests and comments, using 1-4 word phrases. He was able to speak in full sentences with prompting. Stuart sometimes asked questions without prompting but his questions were often repetitive (e.g., “What car you drive?”). Stuart had limited conversational skills, particularly with peers; he would often answer questions but rarely reciprocated with follow-up questions or comments. Stuart was able to follow daily routines at school and needed only minimal support with daily living skills. On the Leiter International Performance Scale, 3rd edition (Leiter-3; Roid, Miller, Pomplun, & Koch, 2013), Stuart achieved a nonverbal IQ score of 100 (50th percentile). Stuart’s classroom teacher identified a variety of preferred break-time activities, including Lego, comic books, and computer use.

**Group Two/Thomas**

Group two consisted of a grade 7 classroom teacher; Thomas, a student with ASD; and four peer coaches. All four peer coaches were 12-year old boys.

**Thomas.** Thomas was a 12-year old boy who was on a modified academic program across all grade 7 subjects. Although he was a member of the grade 7 classroom, he spent approximately 80% of the school day in a resource room or learning skills in the community where he was engaged in individualized instruction (e.g., grocery shopping) and/or programming related to behaviour management (e.g., functional communication training for the reduction of
disruptive behaviour such as screaming). Thomas had full-time support from a 1:1 educational assistant (EA). He communicated using 1-4 word requests (e.g., “swings”, “I want blueberries, please”) and had limited conversational skills (e.g., he did not typically reciprocate questions or comments). Thomas required verbal support to complete daily living skills such as dressing. On the Leiter-3, Thomas achieved a nonverbal IQ score of 49 (<0.1st percentile). Thomas’ classroom teacher identified swings as his most preferred break time activity, with few alternatives.

**Group Three/Alexander**

Group three consisted of a grade 8 classroom teacher; Alexander, a student with ASD; and three peer coaches. All three peer coaches were 13-year old boys.

**Alexander.** Alexander was a 13-year old boy who was on a modified or adapted academic program across all grade 8 subjects. He participated in most class activities with support from a full-time 1:1 EA. He was able to complete some academic tasks at grade level with support (e.g., math equations that did not involve word problems) while other tasks required significant modification (e.g., reading comprehension). Alexander spent between 10%-30% of the day outside of the general education classroom; the amount varied depending on his academic schedule and the occurrence of problem behaviour. For example, Alexander needed support when loud, unexpected sounds occurred and when there was a change in his schedule, and he also received some individualized instruction in academic areas. Alexander communicated verbally and was able to make a variety of requests and some comments about the immediate environment and events. He had limited conversational skills (i.e., he did not typically reciprocate questions or comments and often did not respond when asked a question). Alexander rarely initiated communication with others and sometimes engaged in scripted communication
(e.g., repeating phrases he had heard previously). Alexander was largely independent with daily routines at school with some visual supports (e.g., schedules and social stories). On the Leiter-3, Alexander achieved a nonverbal IQ score of 100 (50th percentile). His classroom teacher identified a wide range of preferences for break activities, including basketball.

**Settings**

The study took place at a private middle school. The training sessions for peer coaches took place in empty classrooms during lunch break (i.e., students who were not participating in the study were not present during training). Baseline and intervention sessions took place in natural environments during lunch breaks. These included the school yard, the library, and the atrium (cafeteria). The school yard had a climbing structure, swings, picnic tables, sports equipment, basketball hoops, paved areas, and a grass field. The library was open to students during lunch break and indoor games and toys were made available (e.g., Lego, decks of cards, board games, iPads etc.). The atrium included tables, benches, and microwaves.

**Measurement**

**Dependent Variables**

Dependent variables included (a) the percentage of engagement between a participant with ASD and at least one peer coach, (b) the percentage of communicative acts (both initiations and responses) by participants with ASD, and (c) the percentage of sessions with indicators of mutual enjoyment between peer coaches and participants with ASD during lunch breaks at school. Engagement was scored when a participant with ASD and at least one peer coach participated together in an activity requiring at least two people, such as playing a game (e.g., catch, tag) or engaging in another type of shared activity (e.g., building Lego structures with a peer, taking turns on a swing, looking at YouTube videos with a peer). Communicative acts
(CAs) included unprompted gestures (e.g., high-fives, waves), facial expressions (e.g., eye contact and smiling), verbal utterances, or vocalizations by participant with ASD. A CA was coded as an initiation if it was not contingent on a peer’s immediately prior CA (i.e., it occurred at least 5 seconds following the peer’s CA). A CA was coded as a response if it was contingent on a peer’s immediately prior CA. Mutual enjoyment behaviours included smiling, eye contact, and laughing. Mutual enjoyment was scored if both the participant and at least one peer coach were observed engaging in one or more of these behaviours during a lunch break session.

**Measurement procedures.** Observations took place during baseline, intervention, and follow-up, during lunch breaks. Observers remained as unobtrusive as possible and minimized interactions with the participants and other students who were in the same setting at the time of the observation (i.e., they did not initiate any interactions but would politely and briefly respond if a student spoke to them). Observation sessions were divided into 30 second intervals and partial interval recording was used. Observers wore an earbud in one ear and were alerted to the start of each interval through a pre-recorded electronic signal. Data were collected using paper and pencil data sheets.

Peer engagement was coded by recording occurrence or non-occurrence for each 30 second interval. Percentage of peer engagement was calculated by dividing the total number of intervals by the total number of occurrences and multiplying by 100. CA initiations and responses were coded separately. Observers recorded the occurrence or non-occurrence of CAs for each 30 second interval. Percentage of initiations was calculated by dividing the total number of intervals by the total number of occurrences and multiplying by 100. Percentage of responses was calculated using a parallel procedure. Observers recorded mutual enjoyment for each 10-
minute break time session by indicating whether or not an indicator behaviour occurred (YES or NO) for both the participant with ASD and at least one peer coach.

**Inter-observer Agreement (IOA)**

Two research assistants (RAs), blind to the purpose of the study and the experimental phase, were trained to collect reliability data. During training, they were provided with a written manual with operational definitions of the dependent variables and protocols for observation and coding; data sheets; and an electronic signal for interval recording. They practiced coding data using videotapes of children who were not involved in the study and did not attend their school, engaged in break-time activities. The videos included both indoor and outdoor play activities. Training continued until each RA achieved at least 90% accuracy for all dependent variables across three video sessions.

During the study, IOA data were collected for 55.67% of observation probes across randomly selected baseline, intervention, and follow-up sessions from different participants. IOA was obtained for engagement, responses, and initiations using interval-by-interval recording. Agreement occurred when both observers recorded either occurrence or non-occurrence for a specific interval. Disagreement occurred when one observer recorded occurrence and the other observer recorded non-occurrence for an interval. Total agreement was divided by the total number of intervals and multiplied by 100. Agreement for mutual enjoyment occurred when both observers recorded YES or NO for the same behaviour (e.g., smiling) for a 10-minute session. Disagreement occurred when one observer recorded YES and the other observer recorded NO for the same behaviour during a session. Total agreement was divided by the total number of behaviours and multiplied by 100. Table 2 summarizes the IOA data in detail.
Table 2. Inter-observer agreement data across phases

<table>
<thead>
<tr>
<th>Group/student with ASD</th>
<th>% of sessions with IOA</th>
<th>Engagement ($M%$, range)</th>
<th>Responses ($M%$, range)</th>
<th>Initiations ($M%$, range)</th>
<th>Mutual enjoyment ($M%$, range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/ Stuart</td>
<td>71</td>
<td>97 (85-100)</td>
<td>96 (90-100)</td>
<td>98 (95-100)</td>
<td>100</td>
</tr>
<tr>
<td>2/ Thomas</td>
<td>50</td>
<td>97.9 (85-100)</td>
<td>90 (60-100)</td>
<td>99.3 (95-100)</td>
<td>90.6 (67-100)</td>
</tr>
<tr>
<td>3/ Alexander</td>
<td>46</td>
<td>97.5 (95-100)</td>
<td>81.7 (75-95)</td>
<td>97.5 (95-100)</td>
<td>94.5 (67-100)</td>
</tr>
</tbody>
</table>

Overall, IOA across participant/groups was 97.5% for engagement, 89.2% for responses, 98.3% for initiations, and 95.1% for mutual enjoyment. One low score for responses (60%) occurred during the first observation probe for one of the two RAs. During this observation, the RA wore two earbuds with the volume turned up high for the interval beep; this affected her ability to hear the responses of the student with ASD. Subsequently, observers either wore only one earbud or turned the volume low so that they could hear both CAs and the interval beep. Two low scores for mutual enjoyment (67%) and one additional low score for responses (75%) are representative of the difficulty in collecting accurate in-vivo data in a natural environment, particularly a loud and busy playground. All of Stuart’s IOA sessions took place in a quiet library and IOA was less variable (85%-100%). Despite these difficulties, the mean IOA was well above 80% for all participants and all dependent variables.

**Implementation Fidelity**

Implementation fidelity was assessed during each 10-minute observation in the baseline, intervention, and follow-up phases. An implementation checklist listed the strategies taught during the peer coach training phase and observers placed a check mark next to each strategy that was used at least one time by at least one of the peer coaches during the observation (Appendix
A). Peer coaches were provided with brief feedback after each session, with specific reference to the strategies that were used or not used. Implementation fidelity during baseline was 0% across all groups (i.e., none of the peer coaches utilized any of the strategies during this phase). No problem behaviour occurred during any of the sessions, so item six on the implementation checklist (redirect problem behaviour and/or seek support from staff) was not applicable across all three groups.

Table 3 summarizes peer coach implementation fidelity in detail for intervention and follow-up phases with regard to the DO, HELP, and TALK strategies that peer coaches were taught. None of the peer coaches interacted with a participant with ASD during any of the baseline sessions, so baseline data were not included here. If a strategy was not needed during the session (e.g., if the participant with ASD independently engaged in the activity so that a peer coach did not need to prompt engagement), the observers noted N/A; these data were not included in the calculations.

Table 3. Peer coach implementation fidelity for intervention and follow-up phases

<table>
<thead>
<tr>
<th>Peer Coach Strategy</th>
<th>Mean % agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1/Stuart</td>
</tr>
<tr>
<td>DO: Initiate an activity or join in</td>
<td>100</td>
</tr>
<tr>
<td>HELP: Prompt engagement in activity</td>
<td>100</td>
</tr>
<tr>
<td>HELP: Prompt communicative acts</td>
<td>100</td>
</tr>
<tr>
<td>TALK: Initiate communicative acts</td>
<td>100</td>
</tr>
<tr>
<td>TALK: Praise/compliment participant</td>
<td>50</td>
</tr>
</tbody>
</table>

**Group 1/Stuart.** The peer coaches in this group used four out of the five strategies during every intervention and follow-up probe session. The only strategy that was not used
consistently by these coaches was the TALK strategy of praising and complimenting. During the first two intervention sessions (sessions 5 and 7), both peer coaches (peer coach -a and -b) were engaged in play with Stuart and all four strategies were used. During sessions 9 and 10, there was only one peer coach and the TALK strategy of praising and complimenting was not used.

**Group 2/Thomas.** The four peer coaches in Thomas’ group utilized two of the strategies 100% of the time across intervention and follow-up phases: DO (initiate or join in an activity) and TALK (initiate CAs). They prompted engagement during 80% of the sessions where prompting was needed. As discussed previously, Thomas was often non-responsive to peer prompts to engage in CAs, which may have resulted in fewer attempts from the peer coaches to prompt CAs. This group consistently used the TALK strategy of giving compliments during 100% of intervention sessions. During the second follow-up session there was only one peer coach (peer -f) and he did not use this strategy.

**Group 3/Alexander.** The three peer coaches in Alexander’s group did not engage with Alexander during one of the intervention sessions (session 10) and one of the follow-up sessions (session 21). As a result, implementation fidelity for this group is lower than other groups. However, during sessions where peer coaches did interact with Alexander, they utilized the strategies consistently. The DO strategy of joining in or initiating an activity, the HELP strategy of prompting engagement and the TALK strategy of initiating CAs were used during 80% of sessions across intervention and follow-up phases. During sessions where the peer coaches did engage with Alexander (i.e., if sessions 10 and 21 were omitted) these three strategies were used 100% of the time. The TALK strategy of giving compliments was used during 70% of sessions; again, if sessions with no peer coaches present were omitted this would increase to 90%. The least utilized strategy for this group was prompting CAs (44%). Alexander most often responded
to peers non-vocally and his peers often accepted these acts of communication without asking for additional CAs. For example, if a peer coach asked Alexander if he wanted to play basketball and instead of responding vocally Alexander smiled and led the peer to the volleyball, this CA was accepted by the peer coach.

**Inter-observer agreement procedures**

Percentage of IOA for implementation fidelity was calculated by adding total agreement (strategy used or not used during the observations) for each strategy, dividing by total agreement plus disagreement, and multiplying by 100. Table 4 summarizes IOA for intervention and follow-up phases.

**Table 4. Implementation fidelity IOA across phases**

<table>
<thead>
<tr>
<th>Peer Coach Strategy</th>
<th>Mean % agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1/ Stuart</td>
</tr>
<tr>
<td>DO: Initiate an activity or join in</td>
<td>100</td>
</tr>
<tr>
<td>HELP: Prompt engagement in activity</td>
<td>100</td>
</tr>
<tr>
<td>HELP: Prompt communicative acts</td>
<td>100</td>
</tr>
<tr>
<td>TALK: Initiate communicative acts</td>
<td>100</td>
</tr>
<tr>
<td>TALK: Praise/compliment participant</td>
<td>100</td>
</tr>
<tr>
<td>Overall IOA across strategies</td>
<td>100</td>
</tr>
</tbody>
</table>

Overall IOA for implementation fidelity across strategies ranged between 88%-100% across groups. Implementation fidelity was 80%-100% for all strategies across groups except for Alexander’s, where IOA for the TALK strategy of giving compliments was 60%. It is likely that the disagreement was a result of the noisy playground environment. The researcher and the RA
stood apart from each other during observations, so there were times when vocal behaviours such as giving compliments may have been missed by one or the other, depending on their physical proximity to a peer coach. In particular, Alexander’s group often engaged in activities that resulted in a great deal of movement around the playground; observers often needed to quickly walk or even run after the group in order to continue the observation for that session. Despite these difficulties, the mean IOA was well over 80% for all components of the intervention.

**Research Design**

A non-concurrent multiple-baseline, multiple-probe across participants design was used in this study. This design was selected because the intervention was not reversible, making a reversal or withdrawal design impossible. While the standard multiple baseline across participants design has the most potential to establish a functional relation between the independent and dependent variables, a non-concurrent multiple baseline design allows for flexibility in applied research settings while still controlling for extraneous variables through the use of randomized baseline lengths (Watson & Workman, 1981). This randomization makes it highly unlikely that changes in behaviour occurring at the point of intervention can be functionally related to a variable other than the treatment, given that intervention is implemented at pre-determined and random points of time. A non-concurrent baseline was the most appropriate for this study due to recruitment timelines and scheduling considerations while also resulting in minimal disruption for participants and peer coaches in a school setting.

It should be noted that, although the baselines were non-concurrent, the entire study took place over a 3-month period, with all three groups of participants starting baseline within a 4-week period. Participants were randomly assigned a baseline length of 4, 6, or 8 days, per the conventions of the non-concurrent baseline design (Barlow, Nock, & Hersen, 2009; Watson &
In addition, probe data were collected during lunch breaks. Probe data were most practical in this setting and also reduced the potential for participant reactivity.

**Procedures**

**Pre-Intervention**

*Cognitive assessment.* The Leiter-3 (Roid et al., 2013) was administered to all of the participants with ASD at the start of the project to assess nonverbal intelligence and general cognitive ability. The Leiter-3 has been standardized on more than 16,000 typically developing individuals across a diverse range of backgrounds including education, ethnicity, gender, and age. One of the benefits of this assessment, in comparison to other cognitive assessments, is that the test is completely nonverbal, making it particularly useful for assessing individuals who are minimally verbal and/or have a cognitive delay. A psychometrist experienced in administering the Leiter-3 with children and youth with ASD conducted the assessment with each participant during school hours in a quiet room at the child’s school.

*Preference inventory.* A school-specific preference inventory was developed and provided to classroom teachers to identify activities that may be of interest to participants with ASD during break times at school (Appendix B). The inventory included a list of age-appropriate activities that were currently available to all students during the break periods at the school where the study took place.

**Baseline**

Baseline sessions took place during lunch break times at school and were pre-determined lengths assigned at random. Observation probes were conducted in the break-time location selected by the student with ASD each day. Peer coaches were not provided with training or feedback during baseline.
Peer Coach Training

The researcher provided training to each group of peer coaches during two 20-25 minute sessions that occurred during lunch break at the school. The participants with ASD were not present for training sessions. The strategies that were taught during training were key strategies pulled from the existing PMI literature. These strategies were labeled DO, HELP, and TALK (Appendix C). The DO strategy required peer coaches to find something to do with their classmate with ASD that would be fun for everyone (based on mutual interests). They could either join in with an activity their classmate was already doing (e.g., “I’m going to read comics with you”) or they could provide choices (e.g., “Do you want to play basketball or volleyball?”) The HELP strategy taught the coaches how to recognize when their classmate with ASD required help and how to provide that help. For example, peer coaches learned that a classmate might need help learning how to play a game or continuing to participate in an activity. Peer coaches were encouraged to help by: (a) telling their classmate how to engage in the activity; (b) showing their classmate how to engage; (c) taking turns with their classmate; and (d) giving choices. The final strategy that peer coaches learned was the TALK strategy, which included three ways to encourage communication: (a) talk to the student with ASD, using positive and enthusiastic language and compliments; (b) talk about the current activity, and (c) ask questions.

During the first training session, peer coaches were provided with a brief overview of the project and key information about the participant with ASD. This included a brief description of the student’s strengths, preferences, and ways that he communicated. Each peer coach was also asked to contribute any knowledge they had about their peer. No diagnoses were disclosed by the researchers during the training sessions. Peer coaches were provided with a copy of the student’s preference inventory that had been completed by the classroom teacher, and were asked to
identify mutual interests. They were encouraged to think about a few activities that would be fun for everyone to do together during lunch breaks. Peer coaches were then introduced briefly to all three strategies and informed that they would learn the first strategy (DO) during the first session and the other two strategies (HELP and TALK) during the next session. A one-page hand-out describing the strategies was provided to each peer coach (Appendix D).

Behaviour skills training (BST; Miltenberger, 2004) was then used to teach the DO strategy. The researcher provided a brief description of the strategy, modelled 2-3 examples of its application, and provided each peer coach with opportunities to role play the strategy. Feedback was provided by the researcher and the other peer coaches. At the end of the session, peer coaches were asked if they had any questions. They were also encouraged to review the handout with strategies before the next session.

During the second training session, the DO strategy was reviewed briefly and peer coaches were given another opportunity to role play a DO scenario and receive feedback. The same procedure was then used to teach the HELP and TALK strategies. Peer coaches were encouraged to role play mutually preferred activities that they might engage in with their classmate with ASD. For example, one group of peers role played each of the strategies in the context of playing basketball; another group of peers role played each of the strategies while playing Lego or reading comic books.

After the second training session, the peer coaches were instructed to use the strategies they had learned during lunch break times with their classmate with ASD. They were asked to work as a team to make sure their classmate had someone to engage with during each lunch break. However, no guidelines were provided for how they might structure these interactions on a day-to-day basis or who would play with the student each day. Peer coaches were reminded
that their own enjoyment during lunch breaks was important as well. Peer coaches were also encouraged to include other peers if there was interest from other classmates. No additional group training was provided.

**Intervention**

The conditions for intervention were the same as during baseline, except that feedback was provided by the researcher after each probe session. Observation sessions took place during lunch breaks in the natural environments. Measurement procedures remained the same as in baseline. Following each observation, the researcher provided brief verbal feedback and praise to the peer coaches for the use of strategies. If peer coaches were not available immediately following the session, she provided feedback prior to the next observation session (e.g., while students were eating their lunch). Feedback included reminders to use the strategies [e.g., “Try giving choices if (peer name) is not responding to yes/no questions” or “Remember to show (peer name) that you like hanging out with him – give him compliments and be enthusiastic!”]. Verbal praise included specific examples of strategies used well [e.g., “Great job offering choices!” or “I could really tell you were having fun with (peer name) today – you were laughing and giving high-fives. That’s great!”]. Feedback was not always provided to every peer coach in the group (e.g., sometimes only one of the peer coaches in the group received the feedback because the other coaches were away or had a lunch club that day). If no peer coaches were present during an observation probe, the feedback was provided the next day. The feedback for peer coaches following a probe with 0% implementation fidelity was a brief reminder of the three strategies (e.g., “I didn’t see any peer coaches yesterday – do you remember the strategies we talked about…? Awesome!”). The intervention phase was discontinued when a participant with ASD achieved (a) 70% or higher engagement and (b) either 70% or higher total
communicative acts OR no increase in communicative acts across three consecutive probes.

Social validity questionnaires were completed by peer coaches and classroom teachers at the end of the intervention phase.

**Follow-up**

Follow-up probes were obtained 5-18 school days post-intervention. During follow-up, conditions were similar to intervention; peer coaches were provided with brief praise following each follow-up probe but no corrective feedback was provided. Participants were observed during lunch break in the natural setting and percentage of peer engagement, percentage of communicative acts, and implementation fidelity was recorded. Social validity was measured through questionnaires that were completed by peer coaches and classroom teachers.
CHAPTER 3: RESULTS

The purpose of this study was to investigate the effectiveness of a low-intensity, low-cost PMI intervention on social behaviours (percentage of peer engagement and CAs) for middle-school aged students with ASD during lunch breaks. The following sections describe the results of the non-concurrent multiple-baseline, multiple-probe across participants design for engagement with peers, CAs, and mutual enjoyment. In addition, the results of the social validity questionnaires for peer coaches and teachers are described.

Results for Engagement

Figure 1 displays the results for engagement for Stuart, Thomas, and Alexander.

Stuart. Two peer coaches (peers -a and -b) were trained to interact with Stuart. No peers (including peer coaches) engaged with him during baseline. Following peer coach training, there was an immediate change in engagement level for three consecutive sessions and no overlap with baseline data. In a single follow-up session, engagement remained at 100% of intervals; a second follow-up probe was not possible because the school year ended. Stuart and his peers engaged in computer, Lego, and playground activities during these sessions. Peer-a engaged with Stuart during all intervention and follow-up sessions; peer-b was out of town for sessions 9 and 10. During session 5, three untrained peers (* in the graph) joined -a and -b with Stuart.

Thomas. Four peer coaches (peers -c, -d, -e, and -f) were trained to interact with Thomas. No peers (including peer coaches) engaged with him during baseline. Following peer coach training, there was an immediate but modest change in the level of engagement for the first two sessions, and no overlap with baseline data. Thomas ate lunch slowly on these two days and had little time to interact with his peers, who waited for him outside. After the second session
Figure 1. Percentage of 30 second intervals with engagement. Letters (-a, -b, etc.) indicate the peer coach(es) who were present in the observation; * indicates untrained peers who were also present.
(session 8), the researcher suggested to the peer coaches that they invite Thomas to play with them while he was eating lunch instead of waiting for him outside. This resulted in a steep upward trend to 80% engagement or higher across the next four consecutive probe sessions, which met the mastery criterion for engagement. Over three follow-up sessions, engagement varied between 30%-100% of intervals, with an overall mean of 65%. Although there was significant variability during follow-up, there was no overlap with baseline. Thomas and his peers played exclusively on the swings in the playground during all intervention and follow-up sessions. All four peer coaches engaged with Thomas during the probe sessions, and untrained peers joined them during the final two follow-up sessions.

**Alexander.** Three peer coaches (peers -g, -h and -i) were trained to interact with Alexander. No peers (including peer coaches) engaged with him during baseline. Following peer coach training, there was an immediate but modest change in the level of engagement for the first session (session 9) with a return to baseline level for the second session (session 10). After the second session, the researcher met with the peer coaches briefly for feedback. The peer coaches reported that each thought a different peer coach was interacting with Alexander that day. The researcher reminded the peer coaches of the first strategy, DO. After this feedback, there was an immediate increase in level to 60% engagement for session 11 and a steep upward trend to 90% engagement or higher across the next four consecutive probe sessions, meeting the mastery criterion for engagement. Although there was overlap between baseline and intervention during session 10, there was no overlap following session 10. Over three follow-up sessions, engagement varied between 0%-80% of intervals, with an overall mean of 45%. Although one of the probe sessions overlapped with baseline (session 21), there was an overall increase in engagement during follow-up, showing a significant maintenance effect. Alexander and his peers
played a variety of activities during intervention sessions. The majority of play involved basketball or volleyball on the playground. All three peer coaches engaged with Alexander during the probe sessions, and untrained peers joined them during 40% of probe sessions across intervention and follow-up phase.

**Results for Communicative Acts**

Figure 2 displays the results for Stuart, Thomas and Alexander for total CAs.

**Stuart.** Stuart initiated one CA with a peer during the third and final baseline session. No other CAs were recorded during the baseline phase; thus, 0% of baseline intervals included responses and 1.7% of intervals included initiations. Following peer coach training, there was an immediate change in level to 70% or higher over three consecutive sessions and no overlap with baseline data, meeting the mastery criterion for CAs. During intervention probes, CAs occurred during 70% of all intervals; 30% of intervals included initiations and 65% included responses. During one follow-up probe, CAs occurred during 75% of all intervals; 5% of intervals included initiations and 75% included responses. Overall, there was a significant increase in CAs following intervention. Stuart engaged in more responses than initiations, with the latter varying considerably between intervention and follow-up. Although the frequency of initiations was variable, there was an overall increase in level of initiations during the intervention phase.

**Thomas.** Thomas initiated one CA with a peer during the fourth and final baseline session (he said “swing” to a peer on the swing when no swing was available). No other CAs were recorded during baseline; thus, 0% of baseline intervals included responses and 1.3% of total intervals included initiations. Following peer coach training, there was an immediate change in level to 15%-45% of probe sessions, with no overlap between baseline and intervention. There was no change in level for the final three sessions (sessions 10, 12 and 16) so the intervention
Figure 2. Percentage of 30 second intervals with communicative acts (initiations + responses). Letters (-a, -b, etc.) indicate the peer coach(es) who were present in the observation; * indicates untrained peers who were also present
phase was terminated, per the discontinuation criteria described previously. During follow-up, there was a decrease in level to 5%-30% of probe sessions, with one data point overlapping with baseline. Although follow-up data were variable, there was an overall change in level in comparison to baseline showing some maintenance of effect. During intervention and follow-up, Thomas engaged in significantly more responses than initiations. During intervention probes, CAs occurred during 28.3% of all intervals; 0.08% of intervals included initiations and 28.3% included responses. Across three follow-up sessions, CAs occurred during 21.7% of intervals; 3.3% of intervals included initiations and 18.3% included responses. Overall, there was a significant increase in CAs following intervention, with the majority of CAs being responses.

Alexander. Alexander initiated one CA with a peer (he gave a high-five while walking past a peer) during the first baseline session. No other CAs were recorded during baseline; thus, 0% of baseline intervals included responses and 5% included initiations. Following peer coach training, there was an immediate change in level during the first intervention session to 30%, followed by one session with 0% CAs (session 10). The remaining sessions showed an increase in level with some variability between 35%-70%. There was no improvement in CAs after session 18, so the intervention phase was terminated, per the discontinuation criteria described previously. There was one session (session 10) with overlap in data between baseline and intervention. During intervention probes, CAs occurred during 49.3% of all intervals; 7% of intervals included initiations and 49.3% included responses. Across three follow-up sessions, CAs occurred during 45% of all intervals; 1.7% of intervals included initiations and 43.3% included responses. Overall, Alexander engaged in many more responses than initiations and there was no increase in initiations following intervention.
Results for Mutual Enjoyment

Table 5 displays the results for mutual enjoyment for Stuart, Thomas and Alexander across intervention and follow-up phases. The following table only includes data from sessions where peer coaches engaged with the participant with ASD (i.e., if no peer coaches were present, data were not included).

**Table 5. Percentage of sessions with mutual enjoyment (peer coach + participant with ASD) during intervention and follow-up phases.**

<table>
<thead>
<tr>
<th>Indicator Behaviour</th>
<th>% of sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1/ Stuart</td>
</tr>
<tr>
<td>Smiling</td>
<td>50</td>
</tr>
<tr>
<td>Eye contact</td>
<td>75</td>
</tr>
<tr>
<td>Laughing</td>
<td>0</td>
</tr>
</tbody>
</table>

% of sessions with 1 or more measures of mutual enjoyment

Overall, mutual enjoyment was observed for the majority of probe sessions across groups. Mutual enjoyment results are discussed for each group in the section below.

**Group 1/Stuart.** Mutual enjoyment was scored for 75% of sessions across intervention and follow-up phases. Mutual eye contact occurred for three out of four sessions and mutual smiling was observed for two out of the four sessions; laughing was not observed. During the two sessions with only one peer coach present (sessions 9 and 10) there were 0-1 indices of mutual enjoyment; during the two sessions with two peer coaches present (sessions 7 and 8), there were two indices of mutual enjoyment. For three of the four intervention sessions, the peer coaches and Stuart engaged in play in the library. It is possible that the rules of the library
dictated a subdued level of play. The type of activities (e.g., Lego or computer games) were also more focused and quiet than other possible games (e.g., basketball); however, all activities were identified by Stuart’s teacher as preferred by him and all of the coaches endorsed them as mutual interests. During the follow-up probe (session 10), Stuart and one peer coach (peer coach -a) played outside on the playground equipment and eye contact was the only observed measure of mutual enjoyment. Again, this was a subdued activity with peer coach and Stuart climbing and/or laying at the top of the structure while talking quietly.

**Group 2/Thomas.** Mutual enjoyment was scored for 100% of sessions across intervention and follow-up phases. Mutual eye contact occurred during 100% of sessions, mutual smiling was observed for 90% of the sessions, and mutual laughing occurred during 70% of sessions. Thomas and his peers played exclusively on the swings during all sessions, with the peer coaches often taking turns pushing Thomas or having friendly competitions with him to see who could swing higher. This was a highly preferred activity for Thomas, as identified on the preference inventory. None of the peer coaches typically played on the swings prior to training but all four coaches indicated during training that they enjoyed swinging.

**Group 3/Alexander.** Mutual enjoyment was scored for 100% of sessions across intervention and follow-up phases. Both smiling and eye contact occurred during 100% of sessions and laughing occurred during 88% of sessions. Alexander and his peers played a variety of activities outside, with the majority of time spent in different ball play activities. Ball play (e.g., basketball and volleyball) were highly preferred activities for both Alexander and his peer coaches as indicated on the preference inventory and by peer coaches during training.
Results for Social Validity

Table 6 displays the results for peer coach social validity and Table 7 displays the results for classroom teacher social validity. Both questionnaires had 10 items and participants were asked to rate each item on a 4-point Likert-type scale where 1 = strongly disagree and 4 = strongly agree. Peer coaches completed the social validity questionnaire at the conclusion of the intervention phase. Peer coaches were asked to complete social validity questionnaires at the end of the follow-up phase; however, because this occurred at the end of the school year, most of the peer questionnaires were not returned.

Table 6. Social validity questionnaire: Peer coaches

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean rating (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am excited to be a peer coach.</td>
<td>4.0 (4.0) 3.25 (3.0-4.0) 4.0 (4.0) 3.75</td>
</tr>
<tr>
<td>2. I feel confident about my ability to be a peer coach.</td>
<td>3.5 (3.0-4.0) 3.25 (3.0-4.0) 3.7 (3.0-4.0) 3.5</td>
</tr>
<tr>
<td>3. I learned helpful strategies during the training sessions.</td>
<td>4.0 (4.0) 4.0 (4.0) 4.0 (4.0) 4.0</td>
</tr>
<tr>
<td>4. Participating in this study had a bad impact on my social life.</td>
<td>1.0 (1.0) 1.75 (1.0-3.0) 1.0 (1.0) 1.25</td>
</tr>
<tr>
<td>5. I had fun during the training.</td>
<td>4.0 (4.0) 3.75 (3.0-4.0) 4.0 (4.0) 3.9</td>
</tr>
<tr>
<td>6. I would recommend being a peer coach to my friend.</td>
<td>3.0 (3.0) 3.25 (3.0-4.0) 3.5 (3.0-4.0) 3.25</td>
</tr>
<tr>
<td>7. I would be a peer coach again in the future.</td>
<td>3.5 (3.0-4.0) 3.25 (3.0-4.0) 3.8 (3.5-4.0) 3.5</td>
</tr>
<tr>
<td>8. I consider the classmate I coached to be a friend.</td>
<td>3.5 (3.0-4.0) 3.25 (3.0-4.0) 3.8 (3.5-4.0) 3.5</td>
</tr>
<tr>
<td>9. I think other kids should learn how to be peer coaches.</td>
<td>3.5 (3.0-4.0) 3.4 (2.5-4.0) 4.0 (4.0) 3.6</td>
</tr>
<tr>
<td>10. Overall, I enjoyed being in this project.</td>
<td>4.0 (4.0) 3.5 (2.5-4.0) 4.0 (4.0) 3.8</td>
</tr>
</tbody>
</table>
Overall, peer coaches in all three groups rated the peer coaching experience positively. All coaches (except for one peer coach in Group 2) strongly agreed or agreed with all of the positive statements in the questionnaire and strongly disagreed or disagreed that the study had a negative impact on their social life (item #4). Some peer coaches also submitted comments with their questionnaires that provide additional information, as summarized in the sections that follow.

**Group 1/Stuart.** Both Group 1 peer coaches (-a and -b) agreed or strongly agreed with all of the statements except for #4, where they both strongly disagreed. One coach stated in the comments section of the questionnaire: “I had a lot of fun peer coaching Stuart because I feel like Stuart feels more welcome here because he knows he has friends there for him.” The other peer coach commented: “It was very fun to play with Stuart and learn the strategies.”

**Group 2/Thomas.** Responses for the Group 2 peer coaches (-c, -d, -e, and -f) were quite variable. Three of the four peer coaches agreed or strongly agreed with all of the positive statements and did not agree that there was any negative impact on their social lives. One of the peer coaches wrote 2.5 (not a rating option that was provided but falling between (2) disagree and (3) agree) for items 9 and 10 on the questionnaire and commented: “I like coaching Thomas but the lack of response from him makes me feel that my acts are useless. I also dislike that I constantly do swings and push, making me feel more like a servant than a friend.” The remaining three coaches wrote the following comments: “Peer coaching is beneficial for both sides of the coaching. I really like this program;” “This was fun while I learned a lot. I still trying harder to become friends with Thomas” and “From time to time, true, peer coaching has gotten in the way of my social life. Even though this has happened, peer coaching with Thomas has been fun and
has brought me joy. Most importantly, it has brought me a new friend that I can interact with more."

**Group 3/Alexander.** The three peer coaches in Alexander’s group (g, h and i) had the highest overall social validity ratings; this group either agreed or strongly agreed with all of the statements except for #4, where they strongly disagreed. The coaches in this group wrote the following statements in the comments section of the questionnaire: “Thank you for having/teaching me. I will make sure Alexander has an astonishing future;” “I really enjoyed being a peer coach, but I think there should be more peer coaches so it doesn’t feel like a job or a chore;” and “It was evident that he (Alexander) had a lot of fun and I’m thankful that you taught me, (peer coach name) and (peer coach name) to communicate with him.”

Classroom teachers completed a social validity questionnaire at the end of the intervention phase and again at the end of the follow-up phase. Table 7 displays the ratings for the teachers of each group/student with ASD at both intervention and follow-up phases.

**Table 7. Social validity questionnaire: Teachers**

<table>
<thead>
<tr>
<th>Item</th>
<th>Group 1/Stuart</th>
<th>Group 2/Thomas</th>
<th>Group 3/Alexander</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I think that peer training is a good way to address the social needs of students with autism.</td>
<td>4.0/4.0</td>
<td>4.0/4.0</td>
<td>4.0/4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>2. I would like to see more peer training for students at RCS in the future.</td>
<td>4.0/4.0</td>
<td>4.0/4.0</td>
<td>4.0/4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>3. The student with autism as benefitted socially from participating in the study.</td>
<td>4.0/4.0</td>
<td>3.0/4.0</td>
<td>4.0/4.0</td>
<td>3.8</td>
</tr>
<tr>
<td>4. The peer coaches benefitted socially from participating in the study.</td>
<td>4.0/4.0</td>
<td>4.0/4.0</td>
<td>4.0/4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>5. The student with autism has more friends as a result of the study.</td>
<td>4.0/4.0</td>
<td>2.0/4.0</td>
<td>4.0/4.0</td>
<td>3.7</td>
</tr>
<tr>
<td>6. The study was disruptive to my classroom and/or students.</td>
<td>2.0/1.0</td>
<td>1.0/1.0</td>
<td>1.0/1.0</td>
<td>1.2</td>
</tr>
</tbody>
</table>
Overall, the social validity ratings for all three classroom teachers were very high. All of the teachers strongly agreed that peer coach training was beneficial for both peer coaches and students with ASD; they strongly agreed that they would like to see more peer training at their school in the future and felt that other students would benefit. They all strongly agreed that their students who received peer coach training enjoyed the experience. They strongly disagreed that the study was disruptive and felt the amount of time that all students were required to participate was reasonable. They all agreed or strongly agreed that they would like to learn how to train peer coaches in the future. They also strongly agreed, overall, that the student with ASD had more friends as a result of the study. There were a few notable improvements in ratings from the first time point (immediately after intervention) to the second time point (after follow-up) and these are described in the section below. Two of the teachers included comments on their questionnaires.

**Group 1/Stuart.** Stuart’s classroom teacher initially disagreed with item 6 (“The study was disruptive to my classroom and/or students”) and later strongly disagreed with the same item. The other ratings remaining consistent for both phases. Stuart’s teacher agreed that she was interested in learning how to train peer coaches in the future; she did not provide a comment on her questionnaire.
**Group 2/Thomas.** After the intervention phase completed, Thomas’ teacher agreed with item 3 (“The student with autism as benefitted socially from participating in the study”) but disagreed with item 5 (“The student with autism has more friends as a result of the study”). These ratings improved on the follow-up questionnaire, where she strongly agreed with both items. She wrote in the comments section: “I was thrilled to participate in this study – the benefits far exceeded my expectations. The opportunity to learn about peer coaching will definitely build momentum in a positive way for all involved. Thank you.”

**Group 3/Alexander.** Alexander’s classroom teacher had the highest social validity ratings, and these remained consistent for both phases. She wrote in the comments section: “This was such a wonderful opportunity for both my peer coaches and my student with autism. All three coaches had an extremely positive experience and expressed that they had fun and the student with autism is now being invited to join friends at launch and break and has been communicating more. The coaches have also helped to calm him down when stressed. Overall, this was very positive and I would love to see more training at our school in the future.”
CHAPTER 4: DISCUSSION

This study used a non-concurrent multiple-baseline, multiple-probe across participants design to investigate the effectiveness of a low-intensity, low-cost PMI intervention on social behaviours for middle-school aged students with ASD during lunch breaks at school. Results provided evidence of a functional relation between the intervention and both engagement and CAs, with three demonstrations of effect across participants. Results maintained during follow-up with some decrease in level and increased variability. Mutual enjoyment was evident for all participants and social validity measures were high for both peer coaches and classroom teachers.

This study adds to the existing PMI research and extends that research by including middle-school aged students and students with varying intellectual and social-communication abilities during lunch breaks in natural settings. This study is unique in that it is the only study involving low-intensity PMI for middle-school aged students (see Table 1). Previous studies with this age group have utilized longer durations of initial and/or ongoing training (e.g., Carter et al., 2005; Schmidt & Stichter, 2012) and low-intensity PMI has been investigated for students in grades 9-12 but not grades 6-8 (e.g., Hughes et al., 2013; Carter et al., 2016; Carter et al., 2017). The findings are discussed as well as limitations, future directions, and conclusions.

Engagement, CAs, and Mutual Enjoyment

Engagement. During baseline, none of the three participants with ASD engaged with their peers during lunch breaks. In fact, the researcher did not observe a single peer approach any of the participants during the baseline probes. All three participants with ASD also engaged in very few CAs (0%-5% across all baseline probes) and, not surprisingly, there were no indices of mutual enjoyment. The complete lack of peer engagement and minimal number of CAs during
baseline suggest that all of these participants were socially isolated at school. This finding is consistent with existing research showing that individuals with ASD are at increased risk of social isolation and that this risk increases as children reach adolescence (Petrina et al., 2014).

Following peer coach training, engagement increased to various degrees across the three participant groups. The variability within and across groups may have occurred for a number of reasons. First, it is important to consider how typically developing youth spend their time during lunch breaks at school. We would not expect most middle-school aged students to play the same activity with the same peer(s) every day; rather, one would expect to see some variability in the activities that they choose and in the peers with whom they engage. The peer coaches in this study were encouraged to make sure that they continued to enjoy their lunch breaks. It is possible that some of the variability in engagement occurred because peer coaches were more interested in a different activity than their classmate with ASD or wished to play with different peers on one of the probe days. Although peer coaches were encouraged to engage with the participant with ASD, there was no requirement that they do so daily; despite this, all three participants with ASD had at least one peer coach engage with them during the majority of observation probes across intervention and follow-up.

The rather narrow operational definition for engagement that was used in this study should also be considered when interpreting the data. If a participant with ASD and a peer coach were both engaged in parallel play without any CAs during the same interval, this was not scored as engagement. For example, if Thomas and a peer coach were swinging next to each other, this was not scored as engagement unless a CA also occurred during the same interval. Therefore, the level of engagement found in this study was quite conservative, particularly for activities where parallel play is appropriate (e.g., swings). Other reasons for variability in engagement were
logistical. For example, Thomas was often very slow to eat and would not go outside until the final few minutes of the lunch break. Peer coaches were also involved in other organized activities (e.g., lunch clubs or volunteering to work in the school store) which sometimes meant that they were unavailable. The researcher did not provide a schedule for peer coaches to follow; despite this, there were very few sessions where no peer coach initiated engagement with a participant.

**Communicative acts.** Similar to engagement, there was an increase in CAs for all participants with ASD, again with considerable variability across participant groups. Stuart was the only participant with ASD who engaged in an increased level of initiations during intervention and he also met mastery criterion for CAs. Stuart had considerably more advanced social-communication skills in comparison to the other participants. In contrast, Thomas had the most significant communication delays and his CAs were the lowest during intervention and follow-up when compared to the other participants. The researcher observed that Thomas’ peer coaches made concerted efforts to initiate and maintain conversation with Thomas; they often used prompting strategies that they had learned during peer coach training. Although their prompting strategies were sometimes effective, a significant level of communicative effort and persistence was required from Thomas’ peer coaches in comparison to the other groups. This is an important consideration, given that one of Thomas’ peer coaches commented on the social validity questionnaire that he struggled with the lack of responsiveness from Thomas. There are educational implications to this variability in CAs for peer coach training that will be discussed in a subsequent section of this chapter.

Variability in CAs can also be attributed to the different activities in which the participants were engaged. For example, Alexander and his peer coaches typically played ball
games. While there was friendly banter back and forth between the peer coaches and Alexander while they played, there were often natural lulls in the conversation as well, as they focused on playing the game rather than talking. The fact that up to 70% of intervals included CAs is impressive in this context. Stuart and his peer coaches played more subdued activities (e.g., working together on a Lego structure) that provided fewer opportunities for conversation, and Thomas’ group played on the swings, which also seemed to limit natural opportunities for CAs.

**Mutual enjoyment.** Similar to CAs, indices of mutual enjoyment may also have been impacted by the types of activities in which participants were engaged. Both Thomas and Alexander engaged in high-energy, physical activities with peers, and at least one measure of mutual enjoyment was observed for 100% of probes for these two groups. Stuart and his peer coaches had fewer indices of mutual enjoyment; however, this may have been due to the type of activity rather than an indication that the peer coach and/or Stuart were not enjoying the activity. Given that Stuart’s peer coaches had high social validity ratings and that the activities were highly preferred by Stuart and the peer coaches, it would seem that there was mutual enjoyment that may not have been captured by the definition used in this study.

**Social Validity**

As discussed in the previous chapter, the social validity for this study was high for both peer coaches and classroom teachers. In particular, the classroom teachers had very high social validity ratings, which suggests that this intervention would likely be acceptable to other school teams. The intervention did not disrupt academic programming or require significant time commitments from any of the participants. Anecdotally, the case manager for two of the participants with ASD noted that there was a reduced need for staff support at break times because the students were consistently engaged with peers rather than staff. Training was
enjoyable for the peer coaches, and all participants showed behavioral indicators of enjoyment during intervention and follow-up. Peer Coach Training

There are a number of factors that may have contributed to the success of this intervention package, and also a number of adjustments that could be made in future extensions of this study. Positive aspects of the intervention will be discussed first, in the sections that follow.

**Mutual interests.** The peer coach training in this study included a priori identification of mutual interests for both peer coaches and their classmate with ASD. This was included as part of the training because children often define friendship in terms of mutual enjoyment of a preferred activity (Newcomb & Bagwell, 2005). As discussed in the introduction, the ultimate goal of a social skills intervention may be for the individual with ASD to have reciprocal friendships. However, a socially valid first intervention goal for a student with ASD who is experiencing social isolation is to increase peer engagement. Participation in mutually enjoyable activities likely contributed to the effectiveness of the PMI intervention in this study in accomplishing that goal for all three students.

**Behaviour skills training.** The researcher utilized behaviour skills training (BST) for the peer coach training and focused on teaching three key strategies. The use of BST was a critical component of this study, particularly by providing opportunities to role play the DO, HELP and TALK strategies with feedback from the researcher. Presenting the strategies in a simple one-page handout was also beneficial, and several coaches commented that they liked having this reminder. All of the peer coaches agreed that the training was fun and that they learned helpful strategies.
**Peer coach feedback.** The researcher provided feedback to peer coaches following each probe observation during the intervention phase; this feedback appeared to be an important component of the intervention package. Initially, there were modest increases in the level of engagement for Thomas and Alexander, with an improving trend that stabilized after a few sessions. It is likely that the feedback provided to peer coaches following the initial observations resulted in the increase. Observing and then providing feedback allowed the researcher to support peer coaches to more effectively apply the strategies learned in training and it also meant that the researcher was able to guide the coaches in quickly solving the initial logistical problems that arose. As the intervention phase progressed, the researcher more frequently reinforced the use of strategies rather than correcting errors or identifying missed strategies. During the follow-up phase, the researcher provided only positive feedback (e.g., “Great job giving choices!”; “It looks like you are all having a great time!”).

**Multiple peer coaches.** Including multiple peer coaches was another positive component of this study. During most observation probes, more than one peer coach engaged with each participant. It may have been that peer coaches were more confident and enjoyed engaging with their classmate with ASD when they had another friend present. In addition, having multiple peer coaches reduced the responsibility for each individual peer coach. One of Alexander’s peer coaches suggested that more peer coaches should be trained so that coaching didn’t become a “chore.”

In the sections that follow, challenges that arose during intervention and related changes to the PMI intervention will be discussed.

**Scheduling.** The logistical factors that accounted for the variability in engagement have implications for peer coach training. For example, it might be helpful to support peer coaches
during training to make a schedule for engaging with their classmate with ASD. Another strategy might be to ask teachers to check in with peer coaches prior to lunch break each day. A schedule or a daily check-in could reduce the likelihood of peer coaches occasionally forgetting or assuming that another coach is playing with their classmate. One or both of these strategies could be faded over time. Other logistical issues could also be addressed during training, such as identifying where and when the participant with ASD typically eats lunch as well as where and when peer coaches might initiate interactions. For example, Thomas’s coaches learned that, if Thomas did not come outside within a reasonable period of time, they could sit with him while he finished eating and then go outside together. If this had been discussed with peer coaches during training, the change in level of engagement following training might have occurred sooner.

**Variety of activities.** Overall social validity was high across all three groups; however, one of the peer coaches in Thomas’s group provided lower ratings across all items and commented that the repetitiveness of playing on the swings every day made him feel like a “servant.” While this student was in the minority, his comment should guide future extensions of this study because it highlights the importance of mutual enjoyment for both peer coaches and students with ASD when implementing a PMI. Although a concerted effort was made to identify mutually preferred lunch break activities, Thomas’s group engaged with Thomas on the swings during every observation probe, as this was Thomas’s most preferred activity. The peer coaches unequivocally reported during feedback that they enjoyed swinging and did not mind doing the same activity every day; however, this was clearly not the case for at least one of the peer coaches. For students with ASD with limited interests or for those who engage in only one activity at lunch break, it would be helpful to introduce an intervention to expand appropriate
play activities prior to or in conjunction with PMI. In addition, if peer coaches are observed to engage in only one activity with a classmate with ASD, it would be helpful to provide supplemental training to support them to expand the activity repertoire.

**Support for students with lower rates of responses.** Thomas’s peer coach with lower social validity ratings also commented: “I like coaching Thomas but the lack of response from him makes me feel that my acts are useless.” As discussed earlier, Thomas’s social-communication skills were the most delayed of all three participants with ASD; for example, he was often non-responsive when peer coaches asked him questions during lunch breaks. A helpful change might be to place more emphasis on the different ways that students with ASD who have social-communication delays might respond (i.e., to emphasize that not all responses are vocal). In addition, future extensions might consider providing supplemental positive reinforcement to peer coaches during the initial stages of peer coaching, particularly when they are engaged with classmates with ASD who have limited communication abilities.

**Limitations**

**Initiations.** Although CAs increased for all three participants with ASD during intervention, the majority of CAs were responses. There were no improvements in initiations for either Thomas or Alexander. Although this is not a surprising result, given that the participants with ASD received no training during the intervention, there are important educational implications. A lack of initiations from the participants with ASD could limit long-term maintenance effects and generalization to other peers. An intervention that includes both peer coach training and training aimed at teaching students with ASD to seek out and initiate engagement with peers could have a more significant long-term impact. For example, if Alexander had learned to invite peer coaches to play basketball with him, we might not have
seen the dip in session 10 when peer coaches either forgot to engage with him or assumed that someone else was engaging with him that day.

**Mutual enjoyment.** As noted previously, although there was an attempt to ensure that activities were mutually enjoyable for both participants with ASD and peer coaches, one peer coach had lower social validity ratings than the others. There were also a few comments from other coaches suggesting that mutual enjoyment was not always achieved. Overall, the mutual enjoyment measures showed that the peer coaches and the participants were both enjoying the activities. However, given that mutual enjoyment is important for friendship development, it is important to note this limitation and make efforts to address it in future extensions or applications of this intervention.

**Assessments.** The Leiter-3 was administered as a pre-intervention assessment to provide additional data regarding the cognitive functioning of the participants with ASD in this study. However, the use of a single, nonverbal cognitive measure has limitations. There is evidence that individuals with ASD score significantly higher on nonverbal assessments in comparison to verbal assessments (Dawson, Soulieres, Gernsbacher & Mottron, 2007; Grondhuis & Mulick, 2013). Thus, some authors recommend that multiple cognitive measures be used when assessing individuals with ASD and/or that cognitive measures include both verbal and performance scales (Scattone, Raggio, & May, 2011, 2012). Because a single, nonverbal measure of cognitive ability was used in this study, it is possible that participants’ scores were higher than if an measure with a verbal component had been administered. Thus, the test scores reported in this study should be considered with caution.

**Potential reactivity.** A potential limitation to this study was that reactivity may have occurred during observation sessions. Reactivity occurs when an assessment (e.g., an
observation) has an effect on the behaviour being observed; reactivity is more likely to occur when observation methods are obtrusive (i.e., participants are aware of the observer and the reason for their presence) (Cooper, Heron, & Heward, 2007) Because this study took place in the natural environment of a school playground, both the researcher and the RA had to be in close proximity to participants in order to see and hear CAs. Thus, it was likely that participants were aware of when observations were taking place. However, since all of the participants attended the same school and were part of the study at the same time, the researcher was on the school playground on most days for a few months over the course of the study. Anecdotally, the researcher often observed peer coaches engaging with participants with ASD on days when she was not collecting data for that group. School staff also shared frequent anecdotes with the researcher about interactions between peer coaches and participants with ASD that they had observed when she was not present. For example, Alexander’s classroom teacher reported that peer coaches were engaging with Alexander during class times as well as breaks. In addition, there were days when the researcher was present and collecting data where no peer coaches engaged with the participant. Given these considerations, reactivity did not appear to be a significant concern, although it may have occurred to some extent.

**Short follow-up.** Unfortunately, only a limited follow-up period was possible due to the end of the school year. The final observation probes occurred during the last few days of school before the summer holiday. Follow-up that extended for a longer duration would have provided valuable information regarding the maintenance effects of this low-intensity PMI.

**Future Directions**

Future research should continue to investigate the effectiveness of PMI with individuals who represent the wide spectrum of ASD in terms of age, communication abilities, and support
needs. In particular, there remains a need for additional research with middle-school and high-school aged students, students who have significant support needs, students who have an intellectual disability, and students who rely on augmentative or alternative communication modalities. Given that the majority of social interactions occur during break periods at school, additional research should take place in the natural environments where youth interact with each other during breaks.

The lack of initiations from participants with ASD was noted as a limitation for this study. A future extension of this study might add to the existing package by also including an intervention aimed at teaching participants with ASD to initiate interactions with peer coaches. As discussed in a previous section of this chapter, initiations from the participant with ASD may contribute to the long-term maintenance of the effects found in this study. In addition, social validity may improve for peer coaches with an increased level of reciprocity in their interactions with their classmate with ASD. This study also highlights the importance of teaching age-appropriate leisure and play skills to children and youth with ASD. The study was most effective for the two participants with these types of activities in their repertoires. For students with limited leisure skills, results may be improved by supporting both the student with ASD and peer coaches to expand play repertoires.

Future research could also investigate a train-the-trainer(s) application of this intervention package, to teach school staff (e.g., classroom teachers, educational assistants) to implement a similar low-cost, low-intensity PMI. Training professionals who are employed by school districts would further increase the feasibility and affordability of this intervention.
Conclusions

This study found that changes in engagement and communicative acts were observed after less than one hour of formal peer coach training for students in middle school. Students with ASD who were socially isolated during break times began to engage and communicate with peers during their lunch breaks. It is important to identify evidence-based interventions that have high social validity from the perspective of school administrators, as interventions that are effective, efficient and cost-effective are most likely to be adopted by schools. This study is an example of such an intervention. Anecdotally, administrators shared with the researcher their satisfaction with the training and results. In fact, the researcher was asked by administrators at the school where the study took place to implement the PMI intervention with additional students in future school years.

The majority of the existing PMI research has included participants with no intellectual disability and/or participants who have been described as having “Asperger’s syndrome” or “more advanced communication skills.” This study extended the research by including middle-school aged students with ASD (aged 11-13) with social-communication delays and moderate to significant support needs. There are only a limited number of PMI studies that have taken place during breaks times in the natural environment with middle-school aged students, so this aspect of the study was also an addition to the current PMI body of literature (Haring & Breen, 1992; Schmidt & Stichter, 2012). Future research should continue to investigate the effectiveness of PMI for students between the ages of 11-18 with varying intellectual abilities and communication abilities and/or modalities (i.e., those who rely on augmentative or alternative communication) during breaks at school in natural environments.
Increasing engagement and communicative acts with peers at school could improve the quality of life for students with ASD who are experiencing social isolation. For some individuals with ASD, this type of companionship with peers may actually fulfill their long-term social needs (Calder et al., 2013). The students who participated in this study as peer coaches were eager to volunteer and were enthusiastic during training and intervention. The classroom teachers did not struggle to find volunteers. This suggests that many typically developing students are motivated to interact with their classmate with ASD; they simply lack the skills required to do so successfully. Use of a simple, easy-to-implement intervention such as the one used in this study holds promise for increasing social engagement and supporting communicative interactions between students with ASD and their classmates.
REFERENCES


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doi.org/10.1111/j.1469-7610.2010.02289.x


doi.org/10.1007/s10803-012-1495-y


### APPENDIX A

**Peer Coach Implementation Fidelity Checklist**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DO:</strong> Did peer coach initiate an activity with the participant or engage in participant-initiated activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HELP:</strong> Did peer coach prompt engagement in the activity?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HELP/TALK:</strong> Did peer coach prompt communicative acts?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TALK:</strong> Did peer coach initiate communicative acts with participant?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TALK:</strong> Did peer coach praise the participant?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did a peer coach redirect problem behaviours and/or seek support from staff?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX B

Preference Inventory

This is a preference checklist to identify activities and locations that your student with ASD enjoys during break times at school. Please mark activities and locations listed below. If you do not know if your student likes an activity or location you can leave that item blank.

✅ = The student enjoys this activity/goes to this location during breaks
? = The student sometimes enjoys this activity/goes to this location during breaks
X = The student does not like this activity/location during breaks

<table>
<thead>
<tr>
<th>Locations</th>
<th>Sports/Playground Equipment</th>
<th>Toys/Games</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Gymnasium</td>
<td>☐ Swings</td>
<td>☐ Foosball</td>
</tr>
<tr>
<td>☐ Library</td>
<td>☐ Climbing Structure</td>
<td>☐ Lego</td>
</tr>
<tr>
<td>☐ Atrium</td>
<td>☐ Slide</td>
<td>☐ Jenga</td>
</tr>
<tr>
<td>☐ Field</td>
<td>☐ Basketball</td>
<td>☐ Books</td>
</tr>
<tr>
<td>☐ Playground</td>
<td>☐ Soccerball</td>
<td>☐ Art supplies</td>
</tr>
<tr>
<td>☐ Computer lab</td>
<td>☐ Volleyball</td>
<td>☐ Keva</td>
</tr>
<tr>
<td>☐ Classroom</td>
<td>☐ Other ball: _____________</td>
<td>☐ Card game: (list)</td>
</tr>
<tr>
<td>☐ Other: ______________</td>
<td>☐ Basketball hoop</td>
<td>☐ Board game: (list)</td>
</tr>
<tr>
<td>☐ Other: ______________</td>
<td>☐ Scooter</td>
<td>☐ Computer game: (list)</td>
</tr>
<tr>
<td>☐ Other: ______________</td>
<td>☐ Bike</td>
<td>☐ Puzzles</td>
</tr>
<tr>
<td>☐ Other: ______________</td>
<td>☐ Other: ______________</td>
<td>☐ Other: ______________</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Activities</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Swinging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Climbing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Running</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Chasing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Walking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Sitting</td>
<td></td>
<td></td>
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<tr>
<td>☐ Building</td>
<td></td>
<td></td>
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<tr>
<td>☐ Listening: ______________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Watching: ______________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Talking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Drawing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Other: ______________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☐ Other: ______________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments

______________________________________________________________________________
______________________________________________________________________________
APPENDIX C

PEER COACH TRAINING MANUAL

Behaviour Skills Training (BST) will be used to teach the 3 peer coach strategies: DO, HELP, TALK.

BST: Describe, model, rehearse, feedback and repeat.

Describe. Provide a brief written and verbal description of each strategy.

Model. Ask a peer to participate as a peer so that you can model each strategy. Model the correct way to use the strategy. You may need to give more than one example if there are participant specific strategies that are important.

Rehearse. Provide peers with a scenario and ask them to take turns rehearsing the strategy just modeled.

Provide Feedback. Provide brief and specific verbal feedback.

Repeat. If peer coaches need additional training for a specific strategy – review each step.

Session I

20-30 minutes

Introductions (2-3 minutes)

Greet peers and thank them for coming.

Who am I? Introduce yourself to the group. My name is Ms. Brain and I am a Behaviour Consultant. You have probably seen me around campus for a few years! My job is to help students who need a bit of extra support at school. For example, sometimes I help students with learning different ways to communicate (have you seen any of your peers using iPads to talk??). I am also a student at UBC and I am researching peer coach training at RCS. I know that it is important for everyone to have friends at school. The goal of my research is to help students who have a more difficult time making friends.

Who are you? Ask peer coaches to introduce themselves. Please introduce yourselves. Tell me your name and something you enjoy doing at school with your friends.

The Project (3-5 minutes)

What are we going to do? Introduce the project to peer coaches.
You have volunteered to be peer coaches for (name). Today and tomorrow I will be teaching you three peer coach strategies. These strategies will help you have more fun with (name) during lunch breaks. After you are done the two days of training, I will ask you to try out the strategies that you have learned when you hang out with (name) during break. Your teacher has chosen three peer coaches so that you can help each other out. Sometimes you might ALL choose to hang out with (name) during lunch break. On other days, maybe only one or two of you will hang out with (name). That is okay. The first goal is for (name) to have at least one peer to hang out with during lunch breaks. The second goal is for everyone to have fun, that includes YOU!

Today we will brainstorm some fun things for you to do with (name) during lunch breaks. After that I will teach you the first of three peer coach strategies. You will learn two more strategies during our training time tomorrow.

Consent. Briefly review assent form with peer coaches. Specifically, remind coaches that their participation is voluntary and they can change their mind at any time. Also review who they can go to if they have questions.

Focus Peer (3-5 minutes)

Who is (name)? Briefly introduce participant with ASD. All of you know (name). You are all going to be peer coaches for (name) because he is struggling to make friends at school.

How does (name) communicate? Describe the participant’s mode of communication. Ask peer coaches to contribute to the discussion with their own observations/experiences. Do you ever talk to (name)? What have you noticed when you talk to (name)? What works best when you are talking to (name)?

How does (name) act? Describe any behaviours of concern or behaviours that may be unusual. Ask peer coaches to contribute to the discussion with their own observations/experiences. Have you ever noticed (name) do anything unusual? Do any of (name’s) behaviours make you nervous or worried?

Mutual Interests (5-10 minutes)

What do YOU like to do at lunch break? Ask everyone to share at least 2-3 different activities they like to do (preferably indoor AND outdoor).

What does (name) like/what does he do at lunch break? Hand out list of activities that (name) enjoys. Discuss the list. Have you ever seen (name) doing any of these activities? What do you think he likes about it?

What do you BOTH like? What do you ALL like? Think about what you like to do at lunch break. Is there anything that you and (name) both like? Brainstorm activities for
lunch break that (name) and each peer coach might enjoy (write down on white board or flip paper for everyone to see.

Introduce Strategies (1-2 minutes)

Provide peer coach hand-out. Tell peer coaches that there are 3 main strategies: DO, HELP and TALK.

Strategy 1: DO something you both like. (10 minutes)

Describe the strategy. This strategy is about doing something that will be fun for everyone. There are two ways to try to do this. 1) join in with (name) if he is already doing something that you both enjoy or 2) suggest a fun activity by giving choices.

Now that we know some activities that you and (name) both like to do, you can try this strategy for those activities.

1) Join in.
   - Say hello. (e.g., “hey, (name)"
   - Tell (name) you are going to join in. (e.g., “I’m going to swing too”)

2) Give Choices.
   - Say hello
   - Give choices. SAY “do you want _____ or ______?” (e.g., “do you want to play lego or read a comic book?”)
   - If (name) does not pick – SHOW and SAY the choices “Do you want _____ (show choice) or _______ (show other choice)?”

Other tips:
   - Watch what (name) is doing. This will give you clues about what he likes (e.g., swinging and jumping off)
   - Do the activity with (name). (e.g., swing and jump off at the same time as (name).
   - If (name) chooses and changes his mind, that’s okay. Do the other choice.
   - If (name) doesn’t want to do the activity WITH you, try doing it next to him.
   - Have fun!

Model joining in.

Role play joining in.

Give feedback as needed.

Model giving choices.
Role play giving choices.

Give feedback as needed.

Model changing mind.

Role play changing mind.

Give feedback as needed.

Next time (2-3 minutes)

Tell peer coaches about the next session. Ask coaches to review the hand-out before the next session. Tomorrow we will practice this strategy again. You will also learn two more peer coaching strategies. Please have a look over the three strategies tonight when you go home so that you have an idea what you will be doing.

Any questions?

End of session.

Session II

20-30 minutes

Note: Materials and activities identified during the first session should be available during session II to use during role play.

Outline for the Session (2 minutes)

Greet peers and thank them for coming. Ask if they have any questions before starting.

REVIEW Strategy 1: DO something you both like. (3-5 minutes)

Briefly describe strategy 1. Remember that you can either JOIN in or GIVE CHOICES. Let’s practice this strategy.

Role play joining in.

Feedback as needed.

Role play giving choices.

Feedback as needed.

Strategy 2: HELP your classmate. (10 minutes)
Describe the strategy. This strategy is about helping (name) do activities with you. Sometimes (name) might need help learning to play the game or he might need encouragement to keep going. You can help your classmate so that he is having more fun.

1) **Tell** him what to do. (E.g., “Throw the basketball to me”)
2) **Show** him what to do. (E.g., “Throw it like this” throw ball)
3) **Take turns**. (E.g., “Here, you can take a shot!” give ball)
4) **Give choices**. (E.g., “Do you want to shoot hoops or play catch?”)

What if these strategies are not working?

If (name) is not really playing with you or if he starts to walk away it is okay to give him some help. Maybe he has changed his mind.

1) Give choices again or invite (name) to do the other activity.
2) If (name) doesn’t want to do the activity WITH you, try doing it next to him.

If (name) is upset or continues to walk away from you it is okay to give him space. You can try again later or the next day. Teachers are there to help (name) if he needs it.

Do not try to help your classmate by touching him.

*Model helping when classmate doesn’t know what to do.* (Tell, show, take turns, choices).

*Role play helping.*

*Give feedback as needed.*

*Model helping when classmate walks away.*

*Role play helping.*

*Give feedback as needed.*

**Strategy 3: TALK to your classmate. (10 minutes)**

Describe the strategy. This strategy is about talking to (name). When you are talking to (name) you should talk to him like he is any of your friends. Sometimes (name) might answer you by talking and sometimes he might answer you in a different way. For example, if you ask (name) to give you something, he might give it to you. That’s a way of communicating!

1. **Show (name) that you like hanging out with him and talking to him.** Be positive and enthusiastic!
• Smile
• Give high-5s
• Give compliments (E.g., “nice shot!” or “that’s an awesome drawing!” or “good move!”)
• Have fun!

2. **Talk about what you are doing.**

• “I’m building a lego car.”
• “Look how high I can swing!”
• “I’m looking for a Calvin and Hobbes comic.”

3. **Ask questions.**

• “What are you building?”
• “Can you give me the red piece?”
• “Where does this piece go?”

Some types of talking are more difficult for (name). Give specific examples of types of questions to avoid e.g., yes/no.

*Model talking.*

*Role play talking.*

*Give feedback as needed.*

**Conclusion (3 minutes)**

Ask peer coaches to try out the strategies they have learned during training starting the next day at lunch break. Now that you have learned these three peer coaching strategies you can use them when you hang out with (name) during lunch break. Remember that you can all play together or you can choose to just hang out 1:1 with (name). If you feel uncomfortable at any time using these strategies or playing with (name), you can stop playing any time.

*Ask if peer coaches have any questions.*

*End.*
APPENDIX D

PEER COACH STRATEGIES

**Strategy 1: DO**

This strategy is about doing something that will be fun for everyone.

- **Join in.** Say hello. Tell your classmate you are going to join in.

OR

- **Give Choices.** Say hello. Ask “do you want to ____ or ____?”

**Strategy 2: HELP**

This strategy is about helping your classmate do activities with you.

- **Tell** your classmate how to do it.
- **Show** your classmate how to do it.
- **Take turns.**
- **Give choices.**

What if these strategies are not working?

- Try a different activity
- Play next to your classmate
- Try again later or the next day

**Strategy 3: TALK**

This strategy is about talking to your classmate.

- **Show (name) that you like hanging out with him and talking to him.** Be positive and enthusiastic!
  - Smile, high-5s, compliments

- **Talk about what you are doing.**
- **Ask questions.**

HAVE FUN!!!