The Role of Context in Interaction Between Students With Significant Disabilities and Their Peers

DISSERTATION

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By

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Abstract

This dissertation explores the theme of comprehensive inclusion support for students with severe disabilities. It consists of a brief introduction, three stand-alone papers, and a research statement. Chapter 1 presents brief background information to introduce the research questions posed in chapters 2 and 3. Chapter 2 provides a systematic review of the literature on peer-mediated interventions for students with intellectual and development disabilities, with a specific focus on dependent measures of peer behavior. Chapter 3 presents a research study that evaluates the impact of context on the interaction behaviors of students with severe disabilities and their peers. Chapter 4 is a practitioner paper that draws on the findings of chapter 2 and chapter 3 to provide recommendations for comprehensive inclusion support across school environments. Finally, Chapter 5 provides a research statement that discusses the place of this dissertation in my work and future directions for my research.
Acknowledgments

I would like to thank the individuals that have made this project possible. To the students and staff who participated in this study, thank you for welcoming me in and making me a part of your classrooms. Your hard work and commitment to the inclusion of all students is inspiring. I would also like to thank my advisors, Dr. Helen Malone and Dr. Matt Brock for your guidance and support throughout this project and this program. Thank you also to my committee members, Dr. Collette Dollarhide and Dr. Lisa Cushing, for your unique perspectives and your feedback on this project. Thank you to Amy Heider for donating so much of your time to ensure my data collection was reliable.

Finally, I want to express my gratitude to my wife, Marie, for her patience and support, and to my family for their encouragement, inspiration, and copious copyediting.
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2001..........................................................Sylvania Southview High School

2006..........................................................B.A. Ohio Wesleyan University

2012..........................................................M.S. Southern Connecticut State University

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**Fields of Study**

Major Field: Education: Educational Studies

Area of Emphasis: Special Education & Applied Behavior Analysis
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Chapter 1: Introduction

This dissertation is written as three stand-alone papers bookended by an introduction and conclusion. The overarching theme of this dissertation is peer support arrangements and their effects on students with severe disabilities. Specifically, I will synthesize the extant literature, present a research study, and provide practitioner guidelines.

**Rationale**

Forming and maintaining friendships over time is essential for living a high quality of life. However, in the areas of socialization and community involvement, students with severe disabilities (e.g., intellectual disability, multiple disabilities) have poorer long-term outcomes than their counterparts in other disability categories and their typical peers. With data from the National Longitudinal Transition Study, Wagner and colleagues (2002) reported that a significant portion (17%) of 6-13 year olds with intellectual disability (ID) had never visited with any friends during the previous year. Fifty percent of the respondents with ID had never or rarely received telephone calls from friends within the past year (Wagner et al., 2002). Focusing specifically on adolescents (age 13 to 16) with ID, less than a quarter (22%) reported that they frequently saw friends outside of school (Wagner, Newman, Cameto, Levine, & Marder, 2003). This
lack of access to socialization can lead lower rates of community involvement and high rates of adults with ID reporting feelings of loneliness (e.g., Gilmore & Cuskelly, 2014; McVilly, Stancliffe, Parmenter, & Burton-Smith, 2006).

**Overview of Barriers to Peer-Interaction in Schools**

Students with severe disabilities face numerous barriers to developing meaningful and long-lasting relationships with their peers. One primary barrier to these relationships forming is the physical access of students with severe disabilities to their peers. Students with severe disabilities often are not enrolled in general education classrooms alongside their peers without disabilities. When students with severe disabilities are enrolled in the same classroom, they often do not spend a large portion of their time in proximity to their peers (Feldman, Carter, Asmus, & Brock, 2016; U.S. Department of Education, 2012).

In addition to lack of access to inclusive environments, the prevailing attitudes of general education students may contribute to the low rates of peer interaction seen among students with severe disabilities. In a large meta-analysis, Nowicki and Sandieson (2002) discovered a consistent negative bias in peers’ attitudes towards their schoolmates with ID. Looking at a specific study, when asked, 60% of general education middle school students said they would be likely to talk to a classmate with ID in the lunchroom or at free time (Siperstein, Parker, Bardon, & Widaman, 2007). These attitudes may be even more strongly held outside of school. Siperstein and colleague (2007) also reported that only 36% of the 5,837 middle school students surveyed said that they would be willing to invite their classmate with ID out with their friends.

These attitudes may also continue into adulthood and may be reflected among general education teachers. Attitudes of school staff are often mixed and many general
educators share concerns about the effects of inclusion of students with severe disabilities on their general education counterparts (de Boer, Pijl, & Minnaert, 2011; Segall & Campbell, 2012). Teachers may be concerned about the time and effort needed to support students with disabilities drawing away from time spent planning for and delivering lessons to the general education students. To compensate for these concerns, the most common model of providing support to students with severe disabilities in the general education class has become an individually assigned adult support—most commonly a paraprofessional—who accompanies the student with severe disabilities to the classroom. This model of individualized support has been shown to encourage greater reliance of the student with severe disabilities on the staff member and to impede the social communication of students with ID with their peers (Carter et al., 2015; Giangreco, 2010).

**Overview of Strategies to Support Peer-interaction in Schools**

In their review of the literature on supporting peer interactions for students with significant disabilities, Carter, Sisco, Chung, and Stanton-Chapman (2010) grouped interventions into three basic approaches: student-focused practices, support-focused practices, and peer-focused practices. First, student-focused practices target specific communication using interventions such as communication books (e.g., Hughes et al., 2013a) and target social skills deficits common for students with intellectual disability and autism using interventions such as explicit instruction (e.g., Licciardello, Harchik, and Luiselli). The goal of these interventions is to equip students with disabilities with the prerequisite skills necessary to successfully interact with their peers (Carter et al., 2010).
Rather than directly targeting the behaviors of the students with disabilities, support-focused practices target the behavior of the adults who structure the environments in which students with and without disabilities interact. The goal of these interventions is to remove systemic barriers to interaction and to create an environment that encourages more interaction. For example, research has shown that paraprofessionals’ proximity to and interactions with students with disabilities can impede the students’ interactions with peers (e.g., Brock & Carter, 2016; Malmgren, 2006). Support strategies in this group include modifying the environment and instruction (Piercy, Wilton, & Townsend, 2002), increasing students’ time in inclusive settings (Kennedy & Itkonen, 1994), planning instructional groupings to foster interactions (e.g., Kamps et al., 2002), and planning cooperative activities that promote interaction between students in general (Carter et al., 2010).

To supplement the interventions directly targeting the skills of students with significant disabilities and the efforts of the adults to create environments that foster interaction, peer-focused practices recruit and train peers to help increase the frequency and quality of interactions with their classmates with significant disabilities. These practices are also commonly called peer-mediated interventions due to the role of the peer as the change agent. Several common forms of peer-mediated interventions have been evaluated by researchers including peer networks, peer-tutoring, and peer support arrangements. Peer networks are more informal groups of peers that are recruited by an adult to offer social supports for a specific student with a significant disability often outside of the classroom (Miller, Cooke, Test, & White, 2003). Alternatively, heterogeneously grouped peer-tutoring recruits individual peers to work one-on-one with
a student with disabilities offering academic supports in a classroom setting (Hudson & Browder, 2014).

Blending both academic and social supports, peer support arrangements have emerged as an evidence-based practice for increasing the interactions of students with significant disabilities and their peers in inclusive settings. To implement a peer support arrangement, a facilitator (e.g., special education teacher, paraprofessional) recruits peers from the general education classroom, orients those peers to their roles in the arrangement, and collaborates to make a plan for providing naturalistic supports with the classroom. For example, Carter, Moss, Hoffman, Chung, and Sisco (2011) utilized a peer support arrangement with three high school students with severe disabilities enrolled in general education classes. They found that peers, who were trained by the researcher, were able to provide a range of academic and social supports, which resulted in a significant increase in the students’ with severe disabilities interactions and engagement in the classroom.

Brock and Carter (2015) extended the literature on peer support arrangements by involving paraprofessionals as the facilitators of these peer support arrangements. With training from the special education teacher, these paraprofessionals successfully implemented this strategy with fidelity for four middle school students with severe disabilities. Likewise, Brock, Biggs, Carter, Cattey, and Raley (2016) replicated this success with paraprofessional-implemented peer support arrangements with four more middle school students with severe disabilities. Examining the broader feasibility of peer support arrangements, Carter and colleagues (2016) utilized a multi-year, large-scale randomized-controlled study to evaluate the effectiveness peer support arrangements
across a large range of participants with severe disabilities. Their study showed strong effects for this support strategy on increasing the total number of interactions of students with severe disabilities and their peers.

**New Directions in Peer-mediated Intervention Research**

Now that a strong body of literature establishing the effectiveness of peer-mediated interventions—such as peer support arrangements—has emerged, there is a growing need for more in-depth analysis of how these strategies affect change. Several large questions remain surrounding peer-mediated interventions including what effects these increased interactions have on the peers recruited into these peer-mediated interventions; what factors (e.g., characteristics of setting, peer collaborators, or facilitators) impact the effectiveness of these peer-mediated interventions, such as peer support arrangements; to what extent do the changes in the behavior of students with and without disabilities in the classroom maintain over time or generalize outside of the classroom in which the invention was implemented; and, finally, to what extent are these strategies going beyond increasing in the frequency of interactions to fostering deeper relationships.

This dissertation begins the exploration of some of the questions in several different ways. First, chapter 2 provides a systematic review of the literature on peer-mediated interventions, with a specific focus on outcomes and methods specific to peers without disabilities. Next, chapter 3 presents the finding of a study that examined impact of context on the effects of a peer support arrangement implemented for 3 students with significant disabilities and 6 of their peers. I examined both the impact of contextual variables of instructional format (e.g., independent work, group work) within the
classroom, but also the generalization of these behaviors into other environments, namely less structured school environments of the cafeteria, recess yard, and gymnasium.

Chapter 4 presents a practitioner’s guide to comprehensive inclusion planning. Finally, chapter 5 provides a comprehensive discussion of how these pieces fit into the existing peer-mediated literature, as well as providing a discussion of how my future research will continue to explore the larger questions of relationship building and long-term outcome for both students with disabilities and their peers.
Chapter 2: Literature Review

In this chapter, I present a review of the literature on peer-mediated interventions with a specific focus on the methods specific to peer participants. A version of this paper was accepted for publication (Schaefer, Cannella-Malone, & Carter, 2016). This version includes an updated literature review presented as an addendum.

Abstract

Although peer-mediated interventions are an evidence-based approach for improving social and learning outcomes for students with intellectual disability (ID), their impact on participating peers has received limited attention. The purpose of this review was to: (a) summarize extant research on the behaviors of peers without disabilities and their perception of interacting with students with ID, (b) identify common behaviors measured for peers, and (c) evaluate the effects of peer-mediated interventions on peers. Toward that effort, we reviewed 53 studies. Results indicate that interventions have successfully increased peers’ interactions with their classmates with ID and suggest some positive outcome for peers; however, consistent methodological gaps limit further analysis. We offer recommendations for strengthening future research involving peers within interventions for students with ID.
The Place of Peers in Peer-Mediated Interventions for Students With Intellectual Disability

A longstanding goal of inclusive education in the United States has been to increase opportunities for students with and without intellectual disability (ID) to meet, learn alongside, and get to know one another within shared school activities (Carter, Bottema-Beutel, & Brock, 2014; Ryndak, Jackson, & White, 2013). Opportunities for peer interaction and friendship formation are essential aspects of child development and make important contributions to well-being (Rubin, Bukowski, & Laursen, 2009). Yet these social connections are often fragile for students with ID across grade levels. According to their parents, 17% of children with ID ages 6 to 13 had never visited with any friends during the previous year and 50% of these children had never or rarely received telephone calls from friends (Wagner et al., 2002). Among adolescents age 13 to 16, only 22% of youth with ID were reported to frequently see friends outside of school; 54% of these youth got together with friends outside of formal groups at least once a week (Wagner, Newman, Cameto, Levine, & Marder, 2003). Such isolation can contribute to feelings of loneliness and other deleterious outcomes (e.g., Gilmore & Cuskelly, 2014).

A number of barriers may coalesce to limit the opportunities students with ID have to develop supportive and satisfying relationships with their peers. One prominent barrier is the limited extent to which students are enrolled in general education classrooms and work collaboratively with their peers (Feldman, Carter, Asmus, & Brock, in press; U.S. Department of Education, 2012). Another salient factor may be the attitudes and expectations of students and school staff in general education settings.
their survey of 5,837 middle school students without disabilities, Siperstein, Parker, Bardon, and Widaman (2007) found that just 60% of peers said they would be likely to talk to a classmate with ID in the lunchroom or at free time and only 36% said they would be willing to invite their classmate with ID out with their friends. In their meta-analysis of 20 studies, Nowicki and Sandieson (2002) documented a negative bias in peers’ attitudes towards their schoolmates with ID. Among educators, attitudes toward inclusive education continue to be quite mixed and they often raise questions and concerns about how best to support the participation of students with ID in inclusive classes and other school activities (de Boer, Pijl, & Minnaert, 2011; Segall & Campbell, 2012). Finally, the reliance on paraprofessionals and individually assigned adult supports in inclusive settings has been shown to stifle the social connections of students with ID (Carter et al., in press; Giangreco, 2010).

Peer-mediated interventions are an evidence-based approach for promoting the inclusion, interactions, and shared activities of students with and without ID (Carter, Asmus, & Moss, 2014). For the purposes of this review, we defined peer-mediated interventions as educational practices in which students with and without disabilities receive training to support their interactions and shared work together in schools. In their review of this literature, Carter, Sisco, Chung, and Stanton-Chapman (2010) identified several categories of interventions involving peers as intervention agents (e.g., peer awareness training, peer support arrangements, peer networks, peer tutoring). Yet much of the empirical literature evaluating these approaches has focused primarily on the behaviors and outcomes of the students with ID who are the primary focus of intervention efforts (cf., Hughes et al., 2013b; Walton & Ingersoll, 2013). To date, no reviews have
focused on the peers without disabilities who take part in and benefit from these interventions. As a result, relatively little is known about these other participants who are intimately linked to the design and impact of peer-mediated interventions. Indeed, peers typically make up much more than half of the students involved in these interventions.

To better understand the delivery and impact of peer-mediated interventions, this review focused on research findings related to the outcomes of participating peers. We sought to answer the following questions: (a) What are the demographics of peers who have been included in peer-mediated intervention studies? (b) What experimental methods (e.g., reliability measures) specific to the peers are used in these studies? (c) What types of peer behaviors have been measured within these studies and how are they operationally defined? (d) What intervention effects are reported for peers (i.e., generalization, maintenance, and follow-up)? (e) What aspects of social validity have been explored in these studies? The ability to speak more directly to how peers participate in and are impacted by these interventions could have an important influence on the extent to which these approaches are ultimately adopted in schools.

Method

Search Procedures

We conducted electronic searches using eight databases: Academic Search Complete, Academic Search Premier, Education Full Text, Education Research Complete, ERIC, Primary Search, Psychology and Behavioral Sciences Collection, and PsycINFO. Search terms for intervention included peer mediat*, peer train*, peer tutor*, peer network*, and peer support. Search terms for disability included intellectual* disab*, developmental* disab*, and mental* retar*. We combined these two sets of terms in pairs...
to create 15 unique searches (e.g., peer mediati* AND intellectual disab*). For each article identified for inclusion, we performed an ancestral search of the articles’ references and a forward search using Google Scholar.

**Inclusion Criteria**

We only included intervention studies published in English in peer-reviewed journals before May 2015 that met the following inclusion criteria. An updated search was conducted through May 2016, and an analysis of those studies is provided in an addendum to this chapter.

**Peer-mediated intervention.** Articles had to report studies evaluating interventions in which students with and without ID were grouped together and provided some type of training to one or both students. We excluded articles comparing measures of behavior based on setting alone (e.g., Kennedy, Shukla, & Fryxell, 1997) or on teacher behavior conditions alone (e.g., Meyer et al., 1987). We also excluded articles in which researchers instructed the peers not to respond during any phase or placed a specific limit on the frequency of responses.

**Dependent measures of peer behavior.** Researchers had to measure at least one peer behavior separately from the behavior of the student with ID. These measures could be a discrete behaviors (e.g., number of communication initiations made by the peer) or a self-report (e.g., peer perception of the student with ID). We excluded studies in which peer training only focused on students with disabilities and articles in which peers’ data were not disaggregated.

**Participant definition.** Participants had to have an ID, be between the ages of 6–22, and attend a school or school-sponsored program (e.g., community-based transition
program). When studies involved some students who met these criteria and others who did not, we only included data for participants who met our criteria.

Coding Procedures

Participants’ demographic information. We coded the number of participants with and without disabilities in each study, along with their age and gender. For students with disabilities, we collected information on the disability label and categorized them as having mild to moderate ID (IQ = 70–40) or severe to profound ID (IQ < 40) and recorded any comorbid disabilities (e.g., autism spectrum disorder, Down syndrome). We collected additional information about the peers, including how they were identified and/or selected for the studies (e.g., nominated by teacher, volunteered) and their prior experience with students with ID.

Experimental methods specific to peers. We coded four variables on the independent variables, the research design, reliability measures, and the settings used in each study. We categorized the independent variables according to the classifications used by Carter et al. (2010): (a) peer support arrangements, (b) peer tutoring, (c) focusing on teaching skills to the student with ID, and (d) miscellaneous. Peer support arrangements included interventions that established formal or informal peer networks, training, and/or coaching peers on interacting with students with disabilities. Peer tutoring interventions included any intervention in which the peer’s role was primarily as an academic support.

Peer measures. We coded two aspects of dependent measures related to participating peers: the specific behaviors measured by researchers and how those measures were defined. We also noted any social validity measures completed by peers.
and categorized them as being collected before, during, and/or after intervention implementation. We recorded the inclusion of and details about generalization and maintenance phases only if those phases focused on the skills acquired by the peer.

**Intercoder Reliability**

To assess the reliability of information collected, a second reader was trained on the 18-variable coding sheet and independently coded 30% of the studies. Coders scored an agreement for every item that was the same and a disagreement for every item that was different. We calculated overall agreement for each article by dividing the number of agreements by the total number of items coded and multiplying by 100. Average agreement was calculated to be 93% (range: 83–100%). Disagreements were resolved by consensus among coders.

**Results**

We identified a total of 53 studies meeting our inclusion criteria. The articles were published between 1979 and 2014; more than half were published before 2000. The articles appeared in 16 different peer-reviewed journals.

**Demographic Information**

Table 1 provides a summary of all participant demographic information. These studies included a total of 654 peers who worked with the students with ID. Of these, 28% were male and 47% were female; gender was not reported for the remaining 24%. Peers ranged in age from 4 to 19 years, though ages were not reported for almost half of peers. Peers’ ages were commonly described in more vague terms, such as “in the same class” as the participant with ID. Fifty-eight percent of peers were described as being nominated for study participation by their teachers or having volunteered to participate,
Table 1.

**Demographic Information of Participants**

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender of peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>309</td>
<td>47%</td>
</tr>
<tr>
<td>Male</td>
<td>186</td>
<td>28%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>159</td>
<td>24%</td>
</tr>
<tr>
<td>School level (age band) of peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary (4–10)</td>
<td>273</td>
<td>42%</td>
</tr>
<tr>
<td>Middle school (11–13)</td>
<td>61</td>
<td>9%</td>
</tr>
<tr>
<td>High school (14–18)</td>
<td>322</td>
<td>49%</td>
</tr>
<tr>
<td>Young adult (19–22)</td>
<td>1</td>
<td>&gt;1%</td>
</tr>
<tr>
<td>Involvement of peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volunteered</td>
<td>98</td>
<td>15%</td>
</tr>
<tr>
<td>Nominated by teachers</td>
<td>279</td>
<td>43%</td>
</tr>
<tr>
<td>Randomly assigned</td>
<td>124</td>
<td>19%</td>
</tr>
<tr>
<td>Peers identified as knowing student with ID prior</td>
<td>340</td>
<td>52%</td>
</tr>
<tr>
<td>Peers already in a peer mediated program</td>
<td>156</td>
<td>24%</td>
</tr>
<tr>
<td>Gender of focus student with ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>78</td>
<td>41%</td>
</tr>
<tr>
<td>Male</td>
<td>108</td>
<td>57%</td>
</tr>
<tr>
<td>Unspecified</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>School level (age band) of focus student with ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary (4–10)</td>
<td>83</td>
<td>44%</td>
</tr>
<tr>
<td>Middle school (11–13)</td>
<td>38</td>
<td>20%</td>
</tr>
<tr>
<td>High school (14–18)</td>
<td>61</td>
<td>32%</td>
</tr>
<tr>
<td>Young adult (19–22)</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Disability of focus student with ID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants with mild to moderate ID (IQ = 41–70)</td>
<td>119</td>
<td>63%</td>
</tr>
<tr>
<td>Participants with severe to profound ID (IQ &lt; 40)</td>
<td>69</td>
<td>37%</td>
</tr>
<tr>
<td>Co-morbidity with autism</td>
<td>54</td>
<td>29%</td>
</tr>
<tr>
<td>Co-morbidity with other additional disabilities</td>
<td>47</td>
<td>25%</td>
</tr>
</tbody>
</table>
and 19% were randomly assigned to participate, including peers in the generalization setting who were naïve to the interventions’ aims. The majority of peers were described as knowing the student with ID prior to the intervention or having previously participated in a peer-mediated program.

**Components of Methods Specific to Peers**

Table 2 provides a summary of method components specific to peers. These studies spanned multiple categories of intervention. Seventy-nine percent of studies measured behavior in at least one inclusive setting, with only 21% of studies taking place solely in self-contained special education classrooms. The majority (77%) of studies included a report of interobserver agreement on peer behaviors. Fewer (26%) reported a reliability measure for their peer training or instructional procedures.

**Independent variables.** Thirty-two studies utilized some type of peer support arrangement that focused on training the peer to support a classmate’s communication and socialization. For example, Chung and Carter (2012) trained a paraprofessional to facilitate a small group of trained peers to initiate conversations and provide naturalistic opportunities for a student with ID to use a speech-generating device. Twelve studies involved structured peer tutoring programs in which a peer actively taught skills or provided information to their classmates with ID. For example, Jimenez, Browder, Spooner, and Dibiase (2012) taught middle school peers to use a time-delay teaching procedure with a graphic organizer to promote the engagement of their classmates with ID in general education science classes. In seven studies, the intervention paired students with ID with their peers and focused on training the student with ID while not providing specific training to the peer. For example, Hughes et al. (2004) evaluated an intervention
package to help students with ID set goals for interacting with their peers in a PE class and then self-prompt and self-monitor their goal achievement.

Table 2.

Components of Methods Specifics to Peers

<table>
<thead>
<tr>
<th>Components</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category of peer-mediated interventions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer support arrangement</td>
<td>32</td>
<td>60%</td>
</tr>
<tr>
<td>Peer tutoring</td>
<td>12</td>
<td>23%</td>
</tr>
<tr>
<td>Focused on participant w/ID</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Dependent measures taken from peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic behaviors</td>
<td>9</td>
<td>17%</td>
</tr>
<tr>
<td>Communication initiations</td>
<td>23</td>
<td>43%</td>
</tr>
<tr>
<td>Communication responses</td>
<td>16</td>
<td>30%</td>
</tr>
<tr>
<td>Duration of interaction</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Fidelity of implementation</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>Focus/topic of interaction</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>Quality of interaction</td>
<td>16</td>
<td>30%</td>
</tr>
<tr>
<td>Same DVs across participants</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>Social validity measures taken from peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collected any measures</td>
<td>26</td>
<td>49%</td>
</tr>
<tr>
<td>Collected prior to implementation</td>
<td>8</td>
<td>17%</td>
</tr>
<tr>
<td>Collected during implementation</td>
<td>16</td>
<td>21%</td>
</tr>
<tr>
<td>Collected after implementation</td>
<td>22</td>
<td>42%</td>
</tr>
<tr>
<td>Other Measures taken from peers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IOA collected on peer behavior</td>
<td>41</td>
<td>77%</td>
</tr>
<tr>
<td>Procedural integrity on peer training</td>
<td>14</td>
<td>26%</td>
</tr>
<tr>
<td>Maintenance of peer behavior</td>
<td>19</td>
<td>36%</td>
</tr>
<tr>
<td>Generalization of peer behavior</td>
<td>9</td>
<td>17%</td>
</tr>
<tr>
<td>Across settings</td>
<td>6</td>
<td>11%</td>
</tr>
<tr>
<td>Across stimuli</td>
<td>3</td>
<td>6%</td>
</tr>
</tbody>
</table>
A wide range of teaching methods were used effectively with peers. Most studies (81%) addressed peer instruction of one type or another. Durations of training programs varied from one 20-min session to 12 30-min sessions. Descriptions also varied widely from short informal training sessions to established protocols. For example, Lee, Odom, and Loftin (2007) used an explicit peer training protocol from previous research. Mortweet and colleagues (1999) used an established classwide peer tutor protocol (Greenwood, Delquadri, & Garta, 1988). The central themes of peer training were providing peers with information about students with ID, providing peers with strategies to communicate with students with ID, and defining peers’ roles in the intervention. Most commonly, training involved written or verbal information and instructions, structured conversations, and modeling and role-play with feedback. Some researchers also incorporated technology into the peer training (e.g., Mundschenk & Sasso, 1995).

**Measures Involving Peers**

**Dependent variables.** Dependent measures by study are shown in Table 3. We categorized dependent measures into eight types. The four most common types centered on measuring communication between peers and students with ID in terms of peer initiations, peer responses, duration of interactions, and interaction focus. *Initiations* by peers toward the student with ID were the most common dependent measure and appeared in 43% of studies. *Responses* by peers to initiations by students with ID were measured in 30% of studies. The operational definition of initiations and responses varied widely across studies and were often aligned with communication methods of students with ID. Authors tended to use and cite their own definition from previous work, but no common operational definition emerged. These variables were often examined together
(i.e., 13 of the 23 studies that examined initiations examined responses). Only three studies looked at responses alone. For example, Weiner (2005) trained peers to respond with specific repair strategies when their classmate used unintelligible speech.

Table 3.

**Summary of Studies Included in Review**

<table>
<thead>
<tr>
<th>Category</th>
<th>Study</th>
<th>Dependent variables</th>
<th>Setting</th>
</tr>
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<tbody>
<tr>
<td>Peer support arrangement</td>
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<td>Carter et al. (2005b)</td>
<td>initiations, responses, and interaction quality</td>
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<td>types of interaction</td>
<td>GE</td>
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<td>Cushing et al. (1997)</td>
<td>academic behaviors</td>
<td>GE</td>
</tr>
<tr>
<td></td>
<td>Chung &amp; Carter (2013)</td>
<td>initiations, responses, and types of interaction</td>
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<td>Eichinger (1990)</td>
<td>initiations, interaction quality</td>
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</tr>
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<td></td>
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<td>types of interaction</td>
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<td>Garrison-Harrell et al. (1997)</td>
<td>duration, interaction quality</td>
<td>GE</td>
</tr>
<tr>
<td></td>
<td>Godsey et al. (2008)</td>
<td>implementation fidelity</td>
<td>SE</td>
</tr>
<tr>
<td></td>
<td>Haring &amp; Breen (1992)</td>
<td>duration, interaction quality</td>
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<td>Peer support arrangement</td>
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<td>initiations &amp; interaction quality</td>
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<td></td>
<td>Hughes et al. (2013c)</td>
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<td></td>
<td>Hunt et al. (1996)</td>
<td>initiations, responses, &amp; types of interaction</td>
<td>GE, NI</td>
</tr>
<tr>
<td></td>
<td>Jameson et al. (2008)</td>
<td>implementation fidelity</td>
<td>GE, SE</td>
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Table 3 continued

*Summary of Studies Included in Review*

<table>
<thead>
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<th>Category</th>
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<th>Dependent variables</th>
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<td>Kohl et al. (1983)</td>
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<td>Kohl &amp; Stettner-Eaton (1985)</td>
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<td>Lee et al. (2007)</td>
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<td></td>
<td>Mundschenk &amp; Sasso (1995)</td>
<td>initiations &amp; implementation fidelity</td>
<td>SE</td>
</tr>
<tr>
<td></td>
<td>Ostrosky &amp; Kaiser (1995)</td>
<td>initiations, responses, duration, implementation fidelity</td>
<td>NI</td>
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<td>Sasso et al. (1998) (Study 1)</td>
<td>initiations, responses, &amp; types of interaction</td>
<td>GE</td>
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<td>Sasso et al. (1998) (Study 2)</td>
<td>initiations &amp; responses</td>
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<td>Schleien et al. (1995)</td>
<td>initiations</td>
<td>NI</td>
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<td>Peer support</td>
<td>Staub &amp; Hunt (1993)</td>
<td>initiations, responses, and types of interaction</td>
<td>SE, NI</td>
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<td>arrangement</td>
<td>Strain et al. (1979)</td>
<td>initiations and responses</td>
<td>NI</td>
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<tr>
<td></td>
<td>Weiner (2005)</td>
<td>responses and implementation fidelity</td>
<td>GE, SE</td>
</tr>
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<td>Peer tutoring</td>
<td>Breen &amp; Haring (1991)</td>
<td>initiations and responses</td>
<td>SE</td>
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<tr>
<td></td>
<td>Collins et al. (2001)</td>
<td>implementation fidelity, interaction quality</td>
<td>GE, SE</td>
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<td>Cooke et al. (1982)</td>
<td>academic behaviors</td>
<td>GE</td>
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<td>Hudson &amp; Browder (2014)</td>
<td>interaction quality</td>
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<td>Hudson et al. (2014)</td>
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<td>Jimenez et al. (2012)</td>
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</tr>
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<td>Kamps et al. (1995)</td>
<td>academic behaviors</td>
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</tr>
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<td>implementation fidelity</td>
<td>SE</td>
</tr>
<tr>
<td></td>
<td>Martella et al. (1995)</td>
<td>types of interaction</td>
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<td>McDonnell et al. (2001)</td>
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Table 3 continued

Summary of Studies Included in Review

<table>
<thead>
<tr>
<th>Category</th>
<th>Study</th>
<th>Dependent variables</th>
<th>Setting</th>
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<tr>
<td>Focused on participant with ID</td>
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<td>Gunter et al. (1988)</td>
<td>initiations, responses, and types of interaction</td>
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<td>Hughes et al. (2000)</td>
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<td>Hughes et al. (2002b)</td>
<td>initiations, responses, and types of interaction</td>
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</tr>
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<td></td>
<td>Hughes et al. (2004)</td>
<td>interaction quality</td>
<td>NI</td>
</tr>
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<td></td>
<td>Hughes et al. (2011 )</td>
<td>initiations and responses</td>
<td>GE, NI</td>
</tr>
<tr>
<td></td>
<td>Reilly et al. (2014)</td>
<td>initiations, responses, and interaction quality</td>
<td>GE</td>
</tr>
<tr>
<td>Other</td>
<td>Peck et al. (1997)</td>
<td>types of interaction</td>
<td>GE, SE</td>
</tr>
<tr>
<td></td>
<td>Piercy et al. (2002)</td>
<td>interaction quality</td>
<td>GE</td>
</tr>
</tbody>
</table>

With two exceptions, studies reporting on initiations and/or responses showed peer-mediated interventions were effective in increasing the communication between students with ID and their peers, at least partly, by increasing the behavior of the peer specifically. Haring, Roger, Lee, Breen, and Gaylord-Ross (1986) reported that peer initiations after training were so variable that they could not draw a conclusion. Sasso, Mundschenk, Melloy, and Casey (1998) reported mixed results, pointing to relatively small increases for two participants involved in dyads when compared to triads of two peers supporting one student with ID.

The duration of interaction—measured in seconds or conversational turns—was collected in only two studies (Brady, Shores, McEvoy, Ellis, & Fox, 1987; Ostrosky & Kaiser, 1995). Both studies implemented peer support arrangements with elementary school students and tracked initiations and responses. Both studies also reported
immediate sustained increases in the duration of interactions between peers and their classmates with ID after the peer was trained.

*Interaction focus* was measured in 21% of studies. This category encompasses a broader range of specific variables. For example, in their peer tutoring study, Klavina and Block (2008) tracked which interactions were focused on the academic work and which were social and noted a steeper increase in academic focused interactions. Likewise, Carter, Moss, Hoffman, Chung, and Sisco (2011) and Carter, Sisco, Melekoglu, and Kurkowski (2008) documented increases in both academic- and social-related interactions among peers and their classmates with ID. Martella, Marchand-Martella, Young, and Macfarlane (1995) taught high school peer tutors to use specific prompts and descriptive praise rather than negative statements, reporting a significant increase in the former and a decrease in the latter.

Less frequently, studies included dependent variables that were more focused on outcomes for the peers than outcomes for the dyad. Eleven studies measured *fidelity of peer implementation* of particular intervention strategies. Four studies taught peers to use specific communication strategies with fidelity (e.g., Garrison-Harrell, Kamps, & Kravits, 1997; Ostrosky & Kaiser, 1995; Mundschenk & Sasso, 1995; Weiner, 2005). Three studies successfully trained peers to implement constant time delay (CTD) with a high degree of fidelity (Godsey, Schuster, Lingo, Collins, & Kleinert, 2008; Jameson et al., 2008; Jimenez et al., 2012). The remaining four studies measured peers’ adherence to the steps of the peer tutoring or peer support protocols (Collins, Branson, Hall, & Rankin, 2001; Kohl, Moses, & Stettner-Eaton, 1983, Kohl & Stettner-Eaton, 1985). These studies all demonstrated that peers could be taught and correctly implement specific social and
academic support strategies.

Peers’ academic behaviors were measured in 17% of studies. For example, Mortweet and colleagues (1999) measured peers’ performance on weekly spelling tests and peers’ engagement with academic tasks in class under both a class wide peer tutoring (CWPT) model and a teacher-led instruction model. The authors reported high assessment scores for both the peers and their classmates with ID during CWPT.

Likewise, Jimenez and colleagues (2012) trained sixth graders as peer tutors in science class, tracked peers’ grades throughout the study, and reported increases in academic achievement during the intervention phase of the study. In fact, every study tracking peers’ academic behaviors showed they maintained or improved on all measures; no studies reported adverse academic effects on peers.

Interaction quality (e.g., peer ratings of how enjoyable conversations were, peers reporting perceptions of classmates with ID) was assessed in 30% of the studies. For example, Haring and Breen (1992) had peers rate how enjoyable and successful interactions were for each session. The scales used to measure the quality of interactions varied. For example, Hughes and colleagues (2002a) used a dichotomous scale of a positive interaction (e.g., peer is smiling, laughing) or a negative interaction (e.g., peer is frowning, avoiding). Conversely, Eichinger (1990) used a 17-item checklist of behaviors (e.g., positive affect, cooperative play) to determine the degree to which the peer was interacting positively with his partner. Garrison-Harrell and colleagues (1997) used the Peer Nomination and Friendship Rating Scale that asked peers to nominate friends for certain activities and answer questions about their classmates, including children with ID. Additionally, Piercy et al. (2002) used a five-item modified version of an earlier Peer-
Acceptance Scale (PAS; Moe, Nacoste, & Insko, 1981).

**Maintenance and generalization.** Thirty-six percent of studies tracked how peers maintained their behavior after intervention was withdrawn. The duration of maintenance and follow-up phases ranged from several sessions to 8 months post-intervention. Studies generally found that peers maintained these behaviors across time. Although these measures were limited, no studies documented significant decreases in peer behavior after the withdrawal of a peer training or coaching intervention.

Only 17% of studies examined peers’ generalization of skills. Six percent of studies looked at peers’ generalization across novel stimuli (Breen & Haring, 1991; Eichinger, 1990; Jameson et al., 2008). For example, Jameson and colleagues (2008) included a generalization phase in which a peer trained in using CTD with one set of stimuli was given a new set of stimuli to teach using CTD. Six studies examined peers’ generalization across settings (Garrison-Harrell et al., 1997; Gunter, Fox, Brady, Shores, & Cavanaugh, 1988; Hughes et al., 2013a; Hughes et al., 2013b; Lee et al., 2007; Peck, Sasso, & Jolivette, 1997). For example, Peck and colleagues (1997) trained peers in the special education classroom, but also took measures of peers’ behavior towards students with ID in the general education classroom.

**Social validity measures.** In total, 49% of the studies included some type of social validity measure from peers. Measures collected before the implementation of the intervention were reported in 17% of studies. For example, Gaylord-Ross, Haring, Breen, and Pitt-Conway (1984) polled a sample of peers to find socially relevant objects (e.g., walkman, Pacman game) to train students with ID to use and then talk about. Hughes and colleague (2011) spent over 11 hours observing random typical peer dyads to establish
normative criterion on conversation topics and frequency of interactions.

Measures collected during the implementation (i.e., interaction quality dependent variables previously discussed, or anecdotal evidence of peer satisfaction) were reported in 30% of studies. For example, Hughes and colleagues (2013a) asked peers to fill out a short questionnaire about how they felt about the interactions following roughly half of their intervention sessions. Throughout the literature, peers rated their interactions with students with ID as enjoyable, and it was commonly reported that an increasing trend in those rating was observed across intervention sessions. None of these student reports suggest peers considered their interactions to be uncomfortable, aversive, or not enjoyable.

Measures collected after the study was completed were reported in 42% of studies. Generally peers highly rated their satisfaction with the interventions and expressed interest in continued participation. Peers frequently reported improved attitudes by acknowledging that they considered the student with ID a friend, reporting they were surprised at how much their partner with ID could do, and suggesting they were surprised at the similarities between their partner with ID and themselves. For example, Jimenez and colleagues (2012) asked peers to fill out a survey and participate in a focus group in which they were asked about how their attitudes towards classmates with ID positively changed throughout the intervention. Carter and colleagues (2008) reported details of how the peers in their study continued to interact with their parents with ID in and out of the classroom. The peers who participated in the peer support study by Weiner (2005) reported enjoying getting to know their classmate with ID better.

**Differences based on age.** On the level of practice, peer-mediated interventions
can look different in implementation in secondary versus elementary settings based on the activities, goals, and resources inherent to each setting. This review found some slight differences in methods used by studies examining peers in secondary setting \( (n = 22) \) versus in elementary settings \( (n = 24) \). First, secondary studies more often looked at academic measures than did elementary \( (19\% \text{ to } 12\%, \text{ respectively}) \). Studies conducted with secondary students also looked at interaction quality and interaction focus more than twice as much as those conducted with elementary students. Elementary studies put slightly more emphasis on tracking initiations and response, and looked at peers’ fidelity of implementation in twice as many studies. When considering setting, secondary students used slightly more general education settings \( (55\% \text{ to } 46\%) \), had slightly less studies conducted only in special education settings \( (13\% \text{ to } 21\%) \), and slightly less neutral settings \( (23\% \text{ to } 37\%) \) than did elementary studies.

**Discussion**

Understanding how peers participate in and are impacted by peer-mediated interventions could provide important insights to educators considering adopting these support models in their schools. Yet little attention has focused on whether and how peers might benefit from a category of interventions often framed as being valuable primarily for students with ID. The purpose of this literature review was to examine peer-related findings in peer-mediated interventions focused on school-age students with ID. Our analyses of these 53 studies highlight both strengths and limitations of the extant literature and identify important directions for future research. Numerous studies demonstrated that various interventions are effective at increasing the frequency of peers’ communication behaviors in the intervention setting, leading to more interactions (e.g.,
Far less attention has been paid to the quality of these interactions, and to their effect on the peers’ perspectives and attitudes. Collectively these studies suggest that the focus on the outcomes and perspectives of peers has been secondary to the outcomes of students with ID, with few studies targeting peers as the primary focus (e.g., Cushing & Kennedy, 1997; Kamps, Locke, Delquadri, & Hall, 1989).

**Implications for Practice**

No findings included in this review suggest peer-mediated interventions have been implemented poorly with peers nor do findings suggest radical changes in how these interventions should be implemented in schools. Conversely, findings corroborate the conclusions of previous reviews (e.g., Carter et al., 2014) that a range peer-mediated interventions may lead to positive outcomes for students with ID. Unique to this review, however, are three practical implications for educators that may expand their views on the use of and rationale for these interventions. First, given the findings of this review, educators can pursue peer-mediated interventions in their schools with some confidence that the interventions will not negatively impact peers. Nine studies examined peers’ academic behaviors for peers from elementary though high school and indicated that interacting with students with ID had no adverse effects on peers’ academic achievement or engagement.

Second, educators might view peer-mediated approaches as interventions with potential benefits for students without disabilities as well. Several studies reported findings that peers engagement increased (Cushing & Kennedy, 1997; Jimenez et al.,
Even more studies anecdotally reported peer-mediated interventions leading to positive changes in peers’ attitudes toward and peers’ expectations of their classmates with ID. Moreover, peers often rated their interactions with students with ID as enjoyable. Peers also described being proud of their participation, expressed pride in the accomplishments of their partners with ID, and expressed a desire to continue interacting with the student with ID.

Finally, given the potential positive outcomes for peers, educators implementing these interventions should focus their data collection on both parties to capture whether and how all students are benefiting. Some of the measures reviewed in this paper could be good measures for educators to incorporate into their own data collection (e.g., tracking peer engagement during class time, tracking peers’ use of specific communication strategies, periodically asking peers about their feelings towards participation). These social and emotional benefits are more difficult to quantify resulting in less literature measuring such variables; however, it is clear these outcomes exist to some extent. It is our hope that practitioners will use the information included in this review to bolster their efforts in advocating for the importance of inclusion and debunking myths about the potential negative effects of inclusion in their own schools by focusing on the benefits of inclusion both to students with ID and to peers.

Implications for Researchers

Although these studies provide an important glimpse into the impact of peer-mediated interventions on students without disabilities, key gaps highlight avenues for future research.

Demographic gaps. Descriptions of peers were rarely as explicit or detailed as
descriptions of participants with ID. For example, gender was not reported for 24% of peers, compared to 2% of students with ID. Examining ages, it is encouraging that ages were evenly distributed between elementary and high school. These finding are inconsistent with the bias toward younger students seen in other reviews of peer interactions (i.e., Carter et al., 2010; Chung, Carter, and Sisco, 2012). The exact age of peers, however, was often unspecified, as many peers were described as “in the same class” as participants with ID. All peers with reported ages were within 2 years of the student with ID, with the exception of students with ID between the ages of 19 and 22 (e.g., Godsey et al., 2008). Omitting this information prohibits parsing out the role demographics may play. Age may be a particularly pertinent variable, given the practical differences in supporting inclusion in an elementary versus secondary school setting.

**Methodological gaps.** Although most of the reviewed studies included rigorous methods, those methods were not equally applied to peers’ behaviors. Studies involving multiple peers in a single intervention phase often reported aggregated totals for the group of peers (e.g., Klavina & Block, 2008), which does not allow for identification and examination of peers who do not respond or respond quickly and robustly to an intervention. Additionally, many peers were only tracked in one experimental phase (i.e., intervention, generalization, or maintenance). Without a corresponding baseline phase for comparison, it is not possible to examine experimental effects for those specific peers. Both the aggregated totals and the frequent absence of comparison phases for peer behaviors are not consistent with single-subject design methodology. These inconsistencies were unique to peer behavior and limit researchers’ ability to analyze more aspects of peer behavior and meta-analyze groups of studies. The current literature
would simply not support an evidence-based review utilizing methodological quality standards such as those recommended by What Works Clearinghouse (Kratochwill et al., 2010).

In addition, the majority of the current literature does not sufficiently describe the procedures used in training the peers to participate in interventions with enough technical detail that future researchers could replicate the procedures. A very small group of studies (15%) evaluated the fidelity with which peer-training procedures were implemented. Without procedural integrity encouraging consistent implementation, it is difficult to analyze the effectiveness of any given intervention. In contrast, procedures used to encourage more accurate and reliable measurement of peer behavior (i.e., IOA) were implemented regularly.

**Lack of emphasis on generalization and maintenance.** The ultimate social validation of any peer-mediated intervention would be observing a robust and prolonged relationship develop between a person with ID and their peer. To evaluate these types of relationships, researchers must adjust how they plan for and collect data on the generalization and maintenance of peers’ behaviors. Of the studies that did include maintenance measures, the duration of data collection only extended to 8 weeks after the withdrawal of the research team. More longitudinal studies carried out over the course of months of for a full school year.

Likewise, with only 17% of studies tracking generalization, the literature does not provide a clear picture of what happens to these relationships across environments. Of the study’s that looked as generalization across settings, three trained the peers in a separate setting (e.g., self-contained special education classroom) and then measured peers
implementation of the program in the general education classroom (Gunter et al., 1988; Hughes et al. 2013b; Peck et al., 1997). In each of these students, peers were instructed to implement the program in a new environment, rather than measuring how peers behaviors changed naturally after implementation in the training environment. No study addressed the generalization of peer behavior to other environments when the peers are trained in the general education setting.

The remaining three studies that looked at generalization of peer behavior in a generalization environment for the target student, but relied on novel peers (Garrison-Harrell et al., 1997; Hughes et al., 2013a; Lee et al., 2007). In this sense, the measurement did not truly involve the generalization of peers’ behaviors, but rather the generalization of the behaviors of the students with disabilities. Future research should design experiments to truly assess the generalization of peer interaction behavior by training peers to implement a peer-mediated intervention in an applied setting (e.g., the general education classroom) and then measuring those same peers behavior in other settings (e.g., cafeteria, another general education classroom).

**Future studies.** We offer several recommendations aimed at more fully exploring the roles and outcomes of students without disabilities involved in peer-mediated interventions for students with ID. First, researchers can extend this literature by better incorporating peer-related measures in their current research. To address the methodological gaps identified in this review, all studies that include peers as participants should at the very least include: (a) a thorough description of peers (e.g., exact age, gender), (b) a description of how that peer was selected and their experience with students with ID, (c) data in every phase (i.e., control, intervention, maintenance, and
generalization), and (d) reliability assessment both of the dependent and independent variables specific to peers.

Second, researchers should design new studies focused specifically on peers as the primary participants. This new line of inquiry should emphasize examining the academic, social, and emotional effects on peers of their interactions with students with ID. Many incidentally address the benefits for peers of interacting and forming relationships with their schoolmates with ID. The emerging findings presented in this review suggest potential benefits, but they are not enough to claim that peer-mediated interventions are causally related to these benefits. For special educators to convince general educators and administrators of the value of peer-mediated interventions, they will need strong evidence of the benefits of these interventions for participating peers. The often-mentioned concern that students without disabilities might fall behind or lose out on important learning opportunities as a result of their involvement in the education of students with ID is not born out in the present literature.

Finally, to fully validate the use of peer-mediated interventions, researchers must emphasize the maintenance and generalization of peers’ interactions with students with ID, assessing their impact outside of the school building or structured school activities. Likewise, researchers should assess whether a peer who learns to successfully interact with a student with ID can carry that training over to new classmates with ID. Ideally, researchers could assess the ability of peers to train other peers. This could lead to more informal and natural interventions, mirroring the growth of networks among typically developing children.

To establish lasting relationships and reverse disappointing social outcomes in
early adulthood, we would argue for a greater emphasis on transition-aged (19–22) students. Only five transition-aged youth with ID participated in these studies. To better support long-term outcomes for people with ID, it is critical that research explores more about building and maintaining relationships through this transition. A portion of this research needs to be conducted in the community, where individuals with ID will most likely socialize after they leave school.

**Conclusion**

The results of this review confirm that peer-mediated interventions have been used effectively to increase the interactions between peers and their classmates with ID by affecting changes in the peers’ behavior. This review presents findings from 53 studies that begin to demonstrate how these interventions may also have beneficial outcomes for peers. To continue to develop this body of literature, we recommend more targeted examinations of peer outcomes, building to the emerging evidence that these intervention help support inclusion by benefiting *all* students in the classroom. Practically, this information could lead to educators implementing peer-mediated interventions with more confidence and viewing them as not only for the support of their students with ID, but of *all* students. Ultimately, the goal of this review is to call attention to the bilateral nature of the study of relationship building for individuals with ID and their peers. This challenge needs a bilateral solution that will be a product of collaboration between the special education field and the general public.
Addendum

This updated literature review was conducted by replicating the methods used in the original review and using an additional filter to limit the search to between 2015 and 2016. The initial search identified 60 potential articles, of which 45 were excluded based on title and abstract. Of the remaining 15, 10 were excluded based on exclusion criteria. For example, Kamps and colleagues (2015) randomized control trial (RCT) on the effects of peer networks on social interactions of children with autism was excluded because they reported interactions in aggregate, and I could not isolate the data for peer behaviors. The remaining five articles (Brock, Biggs, Carter, Cattey, & Raley, 2016; Brock & Carter, 2016; Carter et al., 2016; Hochman, Carter, Bottema-Beutel, Harvey, & Gustafson 2015; Radley, Dart, Furlow, & Ness, 2015) were forward searched using the “cited by” feature on Google Scholar and backward searched by combing each article’s reference section. I did not identify any additional articles this way.

Results

Demographic Information

The five studies included in the updated search added 65 students with significant disabilities to the total. Of these participants, five were elementary school students, five were middle school students, and 55 were high school students. Forty-one of the new participants with significant disabilities were male and 24 were female. The updated search also added 147 peer participants, of which 14 were elementary school students, 13 were middle school students, and 120 were high school students. Descriptions of the peer mirrors the information provided previously (e.g., some studies included ethnicity; selection criteria often included teacher nomination). Two studies reported on the peers’
histories; Brock and Carter (2016) included a history of positive interactions with the target students as a selection criterion for peer participants and Carter and colleagues (2016) reported that 15% of peer participants had previously participated in a peer support arrangement.

**Components of Methods Specific to Peers**

Three studies (Brock et al., 2016; Brock & Carter, 2016; Carter et al., 2016) were conducted in general education classrooms. Hochman and colleagues (2015) conducted their study in the cafeteria during lunch, and Radley and colleagues (2015) used a self-contained special education classroom as their setting. All five studies included a measurement of interobserver agreement with means above 80% for the primary dependent variables. Brock and colleagues (2016), Brock and Carter (2016), and Carter and colleagues (2016) also included a measurement of the fidelity of intervention that was above 80%.

**Independent variables.** Brock and colleagues (2016), Brock and Carter (2016), and Carter and colleagues (2016) all used a peer support arrangement intervention that involved an adult facilitator recruiting and training peers to offer academic and social supports to students with significant disabilities. Hochman and colleagues (2015) used a peer network intervention that involved recruiting a group of peers to meet regularly and plan social supports given in a non-classroom setting for students with significant disabilities. Radley and colleagues (2015) used a peer interaction training intervention that involved training peers to deliver a discrete trial training (DDT) intervention to the students with significant disabilities.
Dependent variables. Although each study included a variety of measurements of adults and target student behavior, Brock and colleagues (2016), Brock and Carter (2016), Carter and colleagues (2016), and Hochman and colleagues (2015) all used interactions of the peer toward the student with significant disabilities as their primary measure of peer behavior. Radley and colleagues differed in that they measured the peers’ implementation fidelity of the DDT intervention as the primary dependent measure on peer behavior.

Maintenance and generalization. None of the studies included by the updated search included measurements of maintenance after an intervention was withdrawn. Carter and colleagues (2016) reported the results of a 1-year follow up probe that found 16% of participants reported continued interaction with the target student they had supported in the study. Two studies included generalization measurements. First, Brock and colleagues (2016) included generalization probes taken in a different environment (i.e., gym class) than the intervention environment (i.e., general education classroom). The authors reported a slight increase over baseline responding for peers prompting and reinforcement behaviors, however, the responding was extremely modest when compared to the intervention setting. Second, Hochman and colleagues (2015) took generalization probes in the cafeteria on days that the peer network was not scheduled to meet. Again, the generalization data did not show a robust change in level when compared to baseline.

Social validity measures. Each of the five newly added studies assessed social validity by asking peers about the acceptability and perceived efficacy of the intervention. Generally, the peers who participated in the peer-mediated interventions rated the acceptability and perceived efficacy of treatment as high.
Discussion

The findings of this updated literature review mirror those of the larger review with a few notable exceptions. First, this search identified the first RCT studies (Carter et al., 2016; Kamps et al., 2016) examining the broader effectiveness of a specific peer-mediated intervention protocol (i.e., peer support arrangements, peer networks). All of the 57 other studies included in this review utilized single subject designs to measure the efficacy of peer-mediated interventions. Three of the five added studies (Brock et al., 2016; Brock & Carter, 2016; Carter et al., 2016) used the same protocol to implement a peer support arrangement that was shown to be effective by Carter and colleagues’ (2016) RCT study. It appears that the literature on peer-mediated interventions is moving towards defining specific interventions that may meet the rigorous standards for evidence-based practices supported by both single subject and group design work as defined by What Works Clearinghouse (2008).

Second, the two studies that included measurements of generalizations departed from previous methods. From the original review, three studies (Gunter et al., 1988; Hughes et al. 2013b; Peck et al., 1997) tracked the same peers across different environments; however, each of these students trained peers in a contrived setting (i.e., self-contained special education classroom) and then measured the generalization of those peers’ behavior in the applied setting (i.e., general education classroom). Brock and colleagues (2016) flipped that scenario and measured generalization from one applied setting to another (i.e., general education classroom to physical education in the gymnasium). Hochman and colleagues (2016) also measured the same peers behaviors across different conditions, but instead of moving across environments, the authors
measured generalization in the same environment with different environmental stimuli (i.e., an adult facilitating a peer network meeting). Both studies represent a more authentic measure of generalization that more accurately represents the effects of the intervention when implemented in the actual setting where it is likely to be implemented in practice.
Chapter 3: Research Paper

In this chapter I present a stand-alone research paper. This paper includes an introduction with a brief literature review, a detailed description of the methods, a description of the results, and the discussion of the findings.

Abstract

Peer support arrangements have been shown to be effective at increasing the interactions between students with severe disabilities and their peers in general education classrooms. They have also been shown to increase the academic engagement of students with severe disabilities. This study examined the effects of different instructional formats (e.g., independent work, group activities) on the efficacy of peer support arrangements for three middle school students with severe disabilities. I also examined the generalization effects of the intervention to other environments (i.e., cafeteria, recess yard). Results indicate that peer support arrangements increase interactions and academic engagement for students with severe disabilities across instruction formats; however, more robust gains were observed during specific instructional formats when compared to others. Furthermore, these gains may not generalize to other settings without additional intervention. Findings are discussed, including limitations and recommendations for future research and practice.
The Effects of Peer Support Arrangements on Interactions Between Students With and Without Significant Disabilities Across Environments

Social relationships with peers are critical to any child’s quality of life and well-being. Unfortunately, students with severe disabilities often struggle to form these relationships (Carter, Sisco, Chung, & Stanton-Chapman, 2010). Data from the Special Education Elementary Longitudinal Study (SEELS, 2006) indicate that only 44.3% of students with intellectual disability (ID) and 43.2% of students with autism report seeing peers socially in any out-of-school activities. In fact, individuals with severe intellectual and developmental disabilities (IDD) have poorer long-term social outcomes compared to adults with milder or no disabilities (Newman et al., 2011). According to the National Longitudinal Transition Study-2 (NLTS2, 2009), a small percentage of individuals with ID or autism reported seeing friends socially outside of work or school on a regular basis. They also report the lowest levels of feeling cared about by friends and family and the lowest level of confidence in their ability to make friends (Wagner, Newman, Cameto, Levine, & Marder, 2007). Moreover, many adults with ID or autism report regular feelings of loneliness and desires to have more social interactions (McVilly, Stancliffe, Parmenter, & Burton-Smith, 2006). In contrast, research indicates that spending even part of the day in an inclusive classroom setting with peers can have a positive effect the reports of students with ID about their own happiness (Logan et al., 1998).

To begin to address this issue, a growing body of literature has proposed many interventions to support the social inclusion of students with severe IDD with their peers. Carter, Sisco, Chung, and Stanton-Chapman (2010) reviewed 83 empirical studies examining interventions aimed at increasing interactions between students with ID or
autism and their peers. Their review found that a variety of interventions have been used to target a broad sample of participants with a wide range of ages and levels of severity of disabilities. A portion of these studies have used student-focused practices (e.g., social stories, pivotal response training) to target the development of different skills of the students with disabilities (e.g., augmentative and alternative communication usage, social skills). Another group of studies used support-focused practices (e.g., instructional grouping, environmental modifications) to increase interactions by changing the behavior of the adults supporting the students with disabilities. A final category of peer-focused practices have involved recruiting and training peers in inclusive environments to act as supports for the student with disabilities.

Peer support arrangements are one such peer-focused practice that has been developed and evaluated to support students with significant disabilities participate more fully in inclusive settings. In this naturalistic support strategy, a facilitator recruits peers without disabilities in the general education classroom and trains those peers to support the socialization and participation of their classmate with a disability. There is emerging empirical evidence that peer support arrangements can increase interactions between students with severe IDD and peers in general education classrooms (e.g., Brock & Carter, 2016; Carter et al., 2016; Carter, Moss, Hoffman, Chung, & Sisco, 2011). Carter and colleagues (2016) evaluated the effectiveness of peer support arrangements in a multi-year, large-scale randomized-controlled study. Their study showed strong effects for this support strategy on increasing the total number of interactions of students with severe IDD and their peers.
A peer support arrangement begins with an adult—usually a teacher or paraprofessional—who identifies and invites between one or more peers without disabilities to participate in the peer support arrangement for a student with a disability. This facilitator develops a peer support plan that outlines specific ways that peers can provide support in different kinds of classroom activities, and shares this plan with peers during and orientation meeting. Plans typically include social supports like greeting the student with disabilities, socializing before class begins, and introducing the student to other peers. Academically, plans often include suggestions such as peers encouraging the student’s engagement in class and praising the student when he or she participates in activities and discussions. Academic supports might also include peers helping the student with tasks related to class, such as discussing assignments, brainstorming ideas before beginning an activity, or scribing the student’s responses for written tasks. After the group has met and implemented the plan in the classroom, the facilitator continues to observe the peer support group, offer occasional feedback, and help peers problem solve issues that arise (Carter et al., 2011).

For students with severe IDD, these supportive relationships with peers in general education settings can provide a meaningful context to learn important communication and social skills (Carter et al., 2010). There is also evidence that these interventions decrease the need for adult support in inclusive settings as peers become more involved (Carter, Asmus, & Moss, 2013). An over-reliance on adult support is one common factor pointed to as a potential barrier to peers interacting more with their classmates with severe IDD. Regardless, it is still unclear if students with disabilities develop lasting relationships that are evident outside of the classroom. Considering the varied contexts
across a school environment, peers trained in general education classrooms may not spontaneously increase their interactions with students with severe IDD in other school settings without additional support in that setting. Engaging in these interactions becomes more complicated in unstructured settings (e.g., cafeteria) where different social contingencies are acting on the peers, and the supports they have been trained to provide may not fit the non-classroom context.

Although the current evidence-based for peer support arrangements is strong, there are a number of practically important questions that remain unanswered. First, no study has looked at the role context (e.g., instructional format, demands of classroom, structure and routines in place) plays in the efficacy of a peer support arrangement. Better understanding the relative efficacy of peer support arrangements during different instruction formats may enable teachers to design classroom activities that are more conducive to facilitating peer interactions. Second, researchers have not yet studied the behaviors of peers involved in these interventions with the same methodological rigor as the behavior of the student with severe IDD (Schaefer, Cannella-Malone, & Carter, 2016). Both parties in an interaction maintain that behavior by socially reinforcing their communication partner; therefore, it is important to understand how these interventions affect the peers involved. Third, few studies have assessed the generalization of the trained peers’ social behaviors (e.g., Hughes et al., 2013a; Hughes et al., 2013b; Jameson, McDonnell, Polychronis, & Riesen 2008). This examination is essential given that relationship building is the ultimate goal of increasing interactions between students with severe IDD and their peers.
Of the studies that have examined generalization of peer behavior, results have been mixed. For example, Hughes and colleagues (2013b) targeted generalization specifically by training peers to use a goal-setting intervention to increase interactions with classmates with disabilities. Although the percentage of intervals spent interacting on average rose in the generalization setting after intervention, the peers’ behavior varied considerably. For two of the dyads, almost half of the generalization session’s percentages of interaction were at or around baseline levels. Therefore, it appears that more comprehensive support is needed to create opportunities for relationships that extend outside the classroom. One potential means to support this generalization is by training peers to use self-management strategies to set goals for initiating interactions with their partners with severe IDD (Hughes et al., 2013).

The aim of this research is to extend the existing literature on peer support arrangements by focusing specifically on the effects of different settings, demands, and instructional formats on peer interactions to environments outside of classrooms. Toward this aim, I asked the following research questions:

1. What are the effects of a peer support arrangement on social interactions of students with severe IDD and their peers in inclusive classroom settings?
2. Does instructional format affect the interactions between students with severe IDD and their peers, before and after implementing a peer support arrangement?
3. To what extent do changes in the interactions between students with severe IDD and their peers as a result of a peer support arrangement generalize to other school environments, specifically unstructured school environments (e.g., cafeteria)?
Method

Participants and Setting

First, I received the approval of the university’s Institutional Review Board and from the district. Next, I worked with a supervising special education teacher, Mrs. Prince, to identify students with severe IDD on her caseload who might benefit from peer support in inclusive settings. I refer to these participants as the target students in the intervention. For this study, I defined a student with a severe IDD as having an educational label of intellectual disability, multiple disabilities, or autism and eligibility for alternate assessment for statewide testing. After I identified participants with severe disabilities and established stable baseline responding, I recruited two peers in the general education environment, and I refer to each group (i.e., student with severe IDD and two peers) as a triad. Using the following criteria, I selected peers that (a) volunteered to participate, (b) were enrolled in the same class as the student with severe IDD, (c) also shared time in another less structured setting (e.g., cafeteria, study hall) with the student with severe IDD, (d) were reported by the teacher as having good records of attendance, and (e) were reported by the teacher as working well with adults.

Each general education classroom had a general education teacher as well as a paraprofessional specifically assigned to support students with IEPs in the class. All of the participants attended a middle school (grades 6–8) in a mid-western suburban school district serving roughly 7,200 students. Throughout the district, 64% of the students were White, 20% were African-American, 6% were Hispanic, and 7% were multi-racial. Fifteen percent of students were served on IEPs, and 28% were economically disadvantaged.
**Sweventh grade science class.** The target student, Adrian, was a 14-year-old White male with autism, who primarily communicated with verbal speech. He scored a 63 for general intellectual ability on the Woodcock-Johnson Test of Cognitive Abilities, third edition. On the Woodcock-Johnson Tests of Achievement, third edition (WJ-ACH; Woodcock, McGrew, & Mather, 2001), his broad reading, writing, and math scores all fell below the 10th percentile in the low to very low range. On the Vineland Adaptive Behavior Scales (VABS; Sparrow, Cicchetti, Balla, 2005), he earned an adaptive behavior composite score of 61, which placed him in the low range. The annual measures goals in Adrian’s IEP included 4th-grade-level mathematics (i.e., adding and subtracting fractions), accuracy and length in writing (i.e., responding to a prompt with at least 30 words), and communication (i.e., responding to questions in complete sentences).

I recruited two peers, Alex and Andre, to support Adrian in science class. Alex was a 13-year-old White male who reported that he had never participated in a peer support program of any kind. Andre was a 13-year-old African-American male who also reported he had never participated in a peer support program. Although both peers reported that they knew Adrian from class, neither reported that they knew him well.

Mrs. Jones, a general education teacher, led Adrian’s science class, supported by Mr. Castle, a paraprofessional. Mrs. Jones had an MA in science education, was licensed to teach science (grades 4–9), and had 23 years of teaching experience. Mr. Castle had 2 years of experience in his current position. Adrian’s science class had 27 students total. Several other students in the classroom received special education services, however, Adrian was the only student with severe IDD.
Sixth grade social studies class. The target student, Phillip, was a 13-year-old White male with fragile X syndrome and epilepsy. He primarily communicated with verbal speech, however, his limited verbal repertoire (e.g., consistent use of repetitive phrases), fast rate of speech, and poor articulation presented challenge for his social communication. He scored a 50 for general intellectual ability on the Kaufman Assessment Battery for Children, second edition (KABC-II; Singer, Lichtenberger, Kaufman, Kaufman, & Kaufman, 2012), placing him below the 10th percentile in the Lower Extreme category. Phillip earned a composite score of 25 for adaptive behavior on the Behavior Assessment System for Children, second edition (BASC-II; Reynolds, 2004), placing him in the extremely low range. On the WJ-ACH, his broad reading, writing, and math scores all fell in the very low range. Phillip’s IEP goals included basic reading (i.e., blending and segmenting CVC words), writing (i.e., orally dictating sentences), basic math (i.e., multiplication by 0, 1, 5, and 10), communication (i.e., using complete sentences to comment), and on-task behavior.

I recruited two peers, Gloria and Samiir, to support Phillip in social studies class. Gloria was an 11-year-old Hispanic female. She reported that she had previously participated in one of her school’s peer support programs, an inclusive social group that met periodically for recreational activities with the students with disabilities in the school’s self-contained classroom. Samiir was a 12-year-old Somali-American male who reported he had never participated in a peer support program. Although both peers reported that they knew who Phillip was, neither reported that they knew him well.

Ms. Grey, a general education teacher, led Phillips’s social studies class. She had a BA in middle childhood education, was licensed to teach social studies and language
arts (grades 4–9), and had 3 years of teaching experience. Ms. Grey was supported by
Mr. McCoy, a paraprofessional, who had 11 years of experience as an instructional aide.
Phillip’s social studies class had 25 students total, two of which had severe IDD.

**Sixth grade science class.** The target student, Scotty, was a 13-year-old White
male with intellectual disability and a mild bilateral hearing impairment. Although Scotty
primarily communicated with verbal speech, his articulation was very poor. Individuals,
even familiar staff, talking to Scotty often had to ask him to repeat himself. He scored a
52 for general intellectual ability on the KABC-II, placing him below the 10th percentile
in the lower extreme category. On the VABS, he earned an adaptive behavior composite
score of 75, which placed him in the moderately low range. On the WJ-ACH, his broad
reading, writing, and math scores all fell in the very low range. Scotty’s IEP goals
included listening comprehension (i.e., answering questions after being read a third grade
text), writing (i.e., orally dictating sentences), basic math (i.e., multiplication by 0, 1, 5,
and 10), decoding (i.e., independently reading CVC words), spelling accuracy, basic
math (i.e., solving 2–3 digit addition and subtraction questions), communication (i.e.,
labeling descriptive attributes), and articulation (e.g., annunciating /sh/, /ch/, /r/).

Two peers, Brody and Jaime, supported Scotty in science class. Brody was a 13-
year-old White male. He reported that he had previously participated in one of his
school’s peer support programs, similar to the one in which Gloria participated. Jaime
was a 13-year-old Hispanic male who reported he had never participated in a peer support
program. Both peers reported that they knew Scotty from class, but neither reported that
they knew him well.
Mr. Banner, a general education teacher, led Scotty’s social studies class. He had a BA in middle childhood education, was licensed to teach science and social studies (grades 4–9), and had 5 years of teaching experience. Mr. Banner was supported by Mrs. Munroe, a paraprofessional, who had 1 year of experience in her current position. Scotty’s science class had 28 students total, two of which had severe IDD.

**Generalization setting.** To assess the extent to which interactions between target students and their peers generalized to novel and less structured school environments, I observed each of the target students during their lunchtime. Students ate lunch by grade (i.e., all sixth graders at lunch at one time) in a single open cafeteria. Students chose seats, but once seated were discouraged from getting up to socialize with other tables. Lunch was served for roughly the first 20 min, then for the remainder of the period students were dismissed either outside to a large recess yard with basketball courts and benches or, during inclement weather, to the gymnasium where the physical education teacher organized games or students were free to sit in the bleachers to socialize.

**Dependent Measures and Measurement**

The primary dependent variable in this study was interactions between participants with severe IDD and their peers measured in percentage of intervals. I used a partial interval recording system (Cooper, Heron, & Heward, 2007) rotating through 15 s of observation and 15 s of recording time for the duration of one class period. The actual length of observations varied, due to participants with severe IDD entering the classroom after the bell or leaving early. On average, observations lasted 38.5 min (range: 27.5–41.0). Interactions were recorded based on who was involved. For the participants with severe IDD, I separately recorded when he or she interacted with the trained peers,
untrained peers, and adults. For each trained peer, I recorded when he or she interacted with the student with severe IDD. All untrained peer interactions oriented toward the student with a severe disability were recorded separately. I defined an interaction as one person engaging in verbal or non-verbal (e.g., gesturing) communicative behaviors toward another person. For example, I recorded each interval in which the student with severe IDD engaged in those behaviors towards an untrained peer, a trained peer, or an adult. The percentage of intervals in which target student or peer interactions occurred were calculated and graphically displayed.

As a secondary dependent variable, I tracked the engagement of the participants with severe IDD. I defined engagement as the target student attending to or participating in class activities as directed by the teacher. Examples of engagement were the student following the teacher’s instructions, asking questions about what was happening in class, orienting towards the teacher when they were speaking, and orienting toward their work when the teacher assigned an activity.

To assess the impact of instructional format, I recorded the instructional format being used in the classroom for the majority of each interval (i.e., at least eight of fifteen seconds). Although, there were moments when the target students were given alternative assignments as the rest of the class (e.g., modified worksheet, material presented in a video rather than text book), those alternatives typically followed the same instructional format. When they did not, I recorded the expectation in place for the entire class. Instructional format was categorized as independent work (i.e., students directed to work on an activity on their own), group work (i.e., students were grouped into pairs or small groups to complete a task), class discussion (i.e., the entire class engaged in a discussion
of a topic), teacher-directed (i.e., the teacher gave instruction, lectured, or presented materials like videos), and unstructured time (i.e., no instructional demand was in place).

Throughout the study, I monitored and recorded how consistently peers used the self-management strategy, which was defined as recording goals and self-monitoring performance. After observations, the data collector checked the peer self-monitoring sheet, recorded if the student wrote a goal for the day, and recorded if the student reported on that goal. This information was also used to give the peers feedback in coaching sessions.

**Data collector training.** The first author, a graduate student in special education, acted as the primary data collector. Prior to beginning the study, I also trained a second data collector to record behavior using a partial-interval recording procedure. First, the second data collector received instruction on the operational definitions, with examples and non-examples of the dependent variables. I answered any questions about the dependent variables or data collection procedures before beginning the next phase of training. Next, I gave the second data collector opportunities to practice using the observation system by coding video examples of children interacting. Following each practice round, I identified and discussed agreements and disagreements between the primary and secondary data collectors. The second data collector did not begin until they reached an average agreement of 90% on all variables in training.

**Research Design**

This study used a single-subject research design, specifically, a multiple probe across participants design (Gast & Ledford, 2014). The experiment included three phases: (a) baseline, (b) intervention in the general education classroom, and (c) intervention in
the generalization setting. I staggered implementation across participants, so that the next triad did not enter into the intervention phase until the previous triad had demonstrated steadily increasing responding. All decisions to change phases were based on measurements of the primary variables (i.e., interactions between the target student and their peers).

**Reliability and Fidelity**

The second data collector independently coded 27.3% of the observations distributed across phases and participants. I calculated agreement using exact agreement (Cooper et al., 2007). Calculations resulted in an overall mean agreement of 98.2% (range: 95.1%–100%) for interactions of the target student to trained peers, 99.6% (range: 97.1%–100%) for interactions of the target student to untrained peers, 99.3% (range: 96.1%–100%) for interactions of target student to adults, 94.5% (range: 84.4%–100%) for the target student’s engagement, 98.5% (range: 96.3%–100%) for interactions of the trained peers to the target student, 99.6% (range: 94.3%–100%) for interactions of untrained peers to the target student, and 99.0% (range: 87.8–100%) for instructional format. A second trained data collector also attended each of the initial peer training meetings and recorded whether sequential steps were completed on a fidelity checklist. Implementation fidelity was 100% for each of the three peer trainings.

**Procedures**

There were three distinct phases in this study. First, in the baseline phase I established a stable picture of how often participants interacted in the natural environment before implementing any intervention. After the participants demonstrated a steady state of responding, I began the primary intervention phase in which I delivered
the intervention in the general education setting and observed the change in participants’ behavior. Throughout baseline and intervention I observed interactions between target students and peers in a generalization setting (i.e., the cafeteria and recess yard). Given that the behavior change did not generalize after implementation of the intervention with all three participants, I attempted to support the transfer the behaviors to a novel environment. I met a second time with the peers and instructed them to implement a similar peer support arrangement in the generalization setting.

**Baseline phase.** In this phase, I repeatedly observed target students in their general education classroom and in the generalization setting for full class periods. During a typical school day, class periods were scheduled for 41 min. No changes were made in the general education classrooms or generalization setting during this phase. Because peer participants had not been identified, all peer interactions were recorded as untrained peers. In accordance with recommended guidelines for this design, participants remained in the baseline phase until (a) I established a stable data pattern of at least five points, and (b) the data of the previous participant displayed a clear therapeutic change (Kratochwill et al., 2010).

**Intervention phase in the general education classroom.** Once a stable baseline was demonstrated in the classroom environment, I implemented the first phase of the peer support arrangement. The first author conducted an initial training of approximately 25 min with both of the peers together. The fidelity checklist for the training consisted of nine components: (a) discussing the purpose for peer support arrangements, (b) orienting peers to their role in the peer support arrangement, (c) sharing background information about the student with the severe disability (e.g., interests, history; I did not share
disability status), (d) discussing some general ideas and specific strategies peers could use to be supportive, (e) modeling and role playing these strategies with coaching and feedback from the first author, (f) discussing when and how the peers should seek help from adults, (g) discussing confidentiality and respectful language, (h) introducing peers to a self-management strategy consisting of goal setting and self-monitoring, and (i) discussing the peers responses to the information and answering questions.

The special education teacher, Mrs. Prince, and the paraprofessionals assigned to support the target student in the general education classrooms participated in the initial training session. During the training, the paraprofessionals were informed about their role as a facilitator during class; however, they were not required to participate in the brief coaching sessions with peers after observation sessions. After meeting with the peers and completing a plan, the first author informed the general education teacher about the meeting, but did not ask them to change anything about their instruction or interactions with the target student.

Throughout this phase, the first author met with both peers together after observations to provide a brief coaching session (i.e., 5–10 min of informal conversation). Each session consisted of the first author giving the peers feedback on their performance, listening to any concerns or difficulty peers had, and troubleshooting any social concerns they had about interacting with the target student. Coaching sessions followed every observation until the triad demonstrated a steady state of increased behavior (e.g., at least five consecutive data points with increased responding). After that, coaching sessions were faded to every other observation.
**Intervention phase in the generalization setting.** Throughout the study, I measured the generalization of interactions behavior to a novel environment. When spontaneous generalization did not occur, I implemented the third phase of this study. This involved meeting with the peers a second time to discuss how to they could provide the target student social supports in the generalization setting similar to how they were doing in the general education classroom. At this time peer participants were instructed to add goals into their self-monitoring system that related to interactions with the target student in the cafeteria and at recess.

**Social Validity**

Consistent and fluent interaction between individuals is a prerequisite for building a relationship; however, only increasing the frequency of interactions will not necessarily produce a meaningful relationship. To further assess the quality of those interactions, and the acceptability and perceived efficacy of the intervention, I used structured interviews to collect qualitative data before and after the intervention went into effect. Interviews consisted of four open-ended questions and five questions that used a multi-leveled scale (i.e., 1 = not at all–5 = very much). The first author interviewed the peers prior to the initial training sessions and at the end of the study. The first author and the special education teacher interviewed the target student. In addition, the first author interviewed the teachers paraprofessionals at the end of the study.

**Results**

**Effects on Peer Interactions General Education Classroom**

Data from the primary variable (i.e., interactions) for each participant across baseline and intervention in the general education classroom are displayed in Figure 1.
Means and standard deviations for these same variables are provided in Table 4 and summarized by instructional format in Table 5. For the primary variable, effects were demonstrated and replicated across all participants, demonstrating a functional relation between implementation of the peer support arrangement and peer interactions. Likewise, when examined by instructional format, interactions consistently increased across formats. Visual analysis of the data in terms of level, trend, and variability is described below for each participant.

During baseline Adrian and his peers demonstrated low levels of interaction (M = 1.6%, range: 0%–5%) with a small amount of variability. When I implemented the intervention (i.e., day 12), I recorded an immediate increase in interactions from Adrian, Alex, and Andre. As seen in Table 4, Alex increased his interactions to a much higher levels than Andre; however, the means for both individual peer participants remained above the baseline aggregate peers’ level. Despite some variability, the interactions for both Adrian and his peers remained steadily higher than baseline levels through the last observation (i.e., day 42). As seen in Table 5, intervention led to increases in interactions across instructional formats. Participants demonstrated the largest increases in group activities (M = 43.4, SD = 18.6), unstructured time (M = 39.5, SD = 34.2), and independent work (M = 27.9, SD = 24.8). Given that unstructured time only represented 1.6% of the total intervals recorded during the intervention phase, data should be interpreted with caution.
Figure 1. Interactions between students with severe IDD and their peers in their general education classroom. Open circles represent target student interactions directed to peers and closed squares represent peers’ interactions directed toward target students.
Table 4.

Percentages of Intervals with Interactions and Academic Engagement by Participant and Phases in the Classroom Setting

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Adrian Baseline</th>
<th>Adrian Invention</th>
<th>Phillip Baseline</th>
<th>Phillip Invention</th>
<th>Scotty Baseline</th>
<th>Scotty Invention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactions to untrained peers</td>
<td>1.6 (1.6)</td>
<td>3.7 (2.9)</td>
<td>0.0</td>
<td>1.4 (1.2)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Interactions to trained peers</td>
<td>—</td>
<td>11.6 (6.1)</td>
<td>—</td>
<td>15.1 (4.9)</td>
<td>—</td>
<td>15.9 (4.7)</td>
</tr>
<tr>
<td>Interactions to adults</td>
<td>4.5 (1.7)</td>
<td>6.0 (4.2)</td>
<td>36.8 (16.9)</td>
<td>9.3 (4.1)</td>
<td>13.6 (4.1)</td>
<td>13.7 (8.2)</td>
</tr>
<tr>
<td>Academic Engagement</td>
<td>42.8 (22.7)</td>
<td>84.8 (19.6)</td>
<td>74.9 (13.5)</td>
<td>83.5 (15.0)</td>
<td>52.6 (20.3)</td>
<td>94.6 (4.3)</td>
</tr>
<tr>
<td>Interactions from untrained peers</td>
<td>1.8 (2.0)</td>
<td>4.3 (4.2)</td>
<td>0.0</td>
<td>5.8 (5.4)</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Interactions from first trained peer¹</td>
<td>—</td>
<td>13.2 (6.6)</td>
<td>—</td>
<td>6.3 (6.6)</td>
<td>—</td>
<td>24.3 (12.1)</td>
</tr>
<tr>
<td>Interactions from first trained peer²</td>
<td>—</td>
<td>2.3 (2.1)</td>
<td>—</td>
<td>18.0 (12.4)</td>
<td>—</td>
<td>0.2 (1.6)</td>
</tr>
</tbody>
</table>

*Note.* Percentages reflect the average across all baseline or intervention observations sessions. Standard deviations are reported in parentheses. ¹Alex, Gloria, and Brody, respectively. ²Andre, Samiir, and Jaime, respectively.
# Table 5.

## Results by Instructional Format

<table>
<thead>
<tr>
<th>Triad</th>
<th>Condition</th>
<th>Percentage of Intervals in which Interaction Occurred</th>
<th>Percentage of Intervals in which Target Student was Engaged</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>IW</td>
<td>GA</td>
</tr>
<tr>
<td>Adrian, Alex, and Andre</td>
<td>baseline</td>
<td>0.0</td>
<td>6.7 (3.4)</td>
</tr>
<tr>
<td></td>
<td>intervention proportion</td>
<td>23.1</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>proportion</td>
<td>27.9 (24.8)</td>
<td>43.4 (18.6)</td>
</tr>
<tr>
<td>Phillip, Gloria, and Samiir</td>
<td>baseline</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>proportion</td>
<td>18.8</td>
<td>35.9</td>
</tr>
<tr>
<td></td>
<td>intervention proportion</td>
<td>50.0 (7.1)</td>
<td>35.7 (11.5)</td>
</tr>
<tr>
<td></td>
<td>proportion</td>
<td>4.8</td>
<td>61.4</td>
</tr>
<tr>
<td>Scotty, Brody, and Jaime</td>
<td>baseline</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>proportion</td>
<td>31.4</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>intervention proportion</td>
<td>25.1 (20.3)</td>
<td>51.9 (18.0)</td>
</tr>
<tr>
<td></td>
<td>proportion</td>
<td>39.5</td>
<td>18.7</td>
</tr>
</tbody>
</table>

*Note.* aAverage proportion of total intervals spent in specific instructional format. IW = independent work, GA = group activity, CD = class discussion, TD = teacher-directed instruction, UT = unstructured time.
Through seven observations in baseline, I recorded no interactions between Phillip and his peers. I recorded an immediate increase in interactions from each of the participants as soon as I implemented the intervention (i.e., day 19). Similar to the previous triad, one trained peer (i.e., Samiir) increased his interactions to much higher levels than the other trained peer (i.e., Gloria). Also similar, the means for both individual peer participants remained above the baseline aggregate peers’ level. Interactions from each of the participants continued steadily above baseline levels with some variability until the last observation (i.e., day 50). When examined by instructional format, this triad demonstrated the greatest increase in interactions during independent work ($M = 50.0$, $SD = 7.1$) and group activities ($M = 35.7$, $SD = 11.5$).

Similar to Phillip, Scotty and his peers demonstrated very little interaction during the ten baseline observations, with only one session recording any interactions. When I implemented the intervention (i.e., day 33), Scotty, Brody, and Jaime each demonstrated an immediate increase in interactions. As with the other two triads, Brody increased his interactions to much higher levels than Jaime while both remained at higher levels than baseline. The data proceeded on an upward trend and peaked at day 40, before beginning a slight downward trend leading to the final observation (i.e., day 48). Results for interactions by instructional format for this triad mirrored the results for the first, with the largest increased for group activities, unstructured time, and independent work ($M = 51.9$, $SD = 18.0$; $M = 30.0$, $SD = 26.6$; $M = 25.1$, $SD = 20.3$, respectively).

**Effects on Academic Engagement**

Data from the secondary variable (i.e., academic engagement) for each student with IDD across baseline and intervention in the general education classroom are
displayed in Figure 2. Means and standard deviations for these same variables are provided in Table 4 and summarized by instructional format in Table 5. The data demonstrate a functional relation between the implementation of the intervention and the target students’ academic engagement. Likewise, when examined by instructional format, engagement increased consistently across formats after the intervention was implemented. Visual analysis of the data in terms of level, trend, and variability is described below for each participant.

As seen in Figure 2, Adrian demonstrated relatively low levels of academic engagement during baseline (M = 42.8, SD = 22.7). After I implemented the peer support arrangement for Adrian, the data demonstrated a clear upward trend, leveling out at a high percentage of engagement with less variability than in baseline (M = 84.8, SD = 19.6). Examining the data by instructional format, Adrian displayed large gains in engagement in each format with the exception of class discussion that remained the same and accounted for less than 2% of the intervals in each baseline and intervention. Group activities provided the highest level of engagement with the least variability (M = 97.9, SD = 4.1).

Phillip demonstrated the highest levels of engagement during baseline (M = 74.9, SD = 13.5) and the most moderate gains during intervention (M = 83.5, SD = 15.0). Immediately after intervention, Phillip’s engagement increased and established a steady trend despite considerable variability that caused some overlap with his baseline data. Phillip demonstrated moderate gains in engagement across each of the instructional formats with independent work providing the highest level and lowest variability (M = 100.0, SD = 0.0).
Figure 2. Academic engagement of students with severe IDD.
Scotty displayed the greatest amount of variability during baseline (M = 52.6, SD = 20.3) and demonstrated the starkest change in intervention with no overlap at all. Immediately upon implementation of the intervention, Scotty displayed a significant increase in engagement, which he maintained with very little variability (M = 94.6, SD = 4.3). With the exception of engagement during class discussion, which was high in baseline, Scotty demonstrated significant increases across instructional formats. Group activities provided his highest level of engagement with the least variability (M = 100.0, SD = 0.0).

**Effects of Intervention in the Generalization Setting**

Figure 3 presents results for each participant across baseline, implementation of the intervention in the general education classroom, and implementation of the intervention in the generalization setting (i.e., at lunch and recess). Table 6 presents mean percentages for each variable across baseline and intervention in the generalization setting. When peer support arrangements were implemented in the general education classroom, there were no discernable effects on interactions in the generalization setting. When I extended the intervention to the cafeteria and recess yard, I observed immediate, modest increases in interaction for each of the three target students demonstrating a functional relation between the extended intervention and the participants’ interactions. Intervention in the generalization environment produced less robust results than in the general education classroom; however, the intervention clearly resulted in a therapeutic change. Visual analysis of the data in terms of level, trend, and variability is described below for each participant.
Figure 3. Interactions between students with severe IDD and their peers at lunch and recess. Open circles represent target student interactions directed to peers and closed squares represent peers interactions directed toward target students.
### Table 6.

**Percentages of Intervals With Interactions by Target Student and Phases in the Generalization Setting.**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Adrian</th>
<th>Phillip</th>
<th>Scotty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Invention</td>
<td>Baseline</td>
</tr>
<tr>
<td>Interactions to untrained peers</td>
<td>0.3 (0.5)</td>
<td>0.3 (0.5)</td>
<td>0.0</td>
</tr>
<tr>
<td>Interactions to trained peers</td>
<td>—</td>
<td>4.0 (1.7)</td>
<td>—</td>
</tr>
<tr>
<td>Interactions from untrained peers</td>
<td>0.3 (0.5)</td>
<td>0.5 (1.1)</td>
<td>0.0</td>
</tr>
<tr>
<td>Interactions from first trained peer</td>
<td>—</td>
<td>4.8 (0.7)</td>
<td>—</td>
</tr>
<tr>
<td>Interactions from second trained peer</td>
<td>—</td>
<td>2.1 (0.3)</td>
<td>—</td>
</tr>
</tbody>
</table>

*Note.* Percentages reflect the average across all baseline or intervention observations sessions. The baseline reported here includes the sessions during which intervention was implemented in the general education classroom.

Adrian and his peers demonstrated consistently low levels of responding through baseline and through implementation of the intervention in the general education setting. Immediately upon intervention in the generalization setting, interactions for all participants increased developing a slight downward trend with little variability.

I recorded no interactions between Phillip and his peers in the generalization setting through three observations in baseline and six observations while the intervention
was in place in the general education classroom. When the intervention was extended, Phillip’s peers demonstrated an immediate significant increase, while Phillip’s data developed an upward trend. Again, the data for this triad in the generalization setting showed less variability than in the general education classroom.

Scotty and his peers showed consistent low levels of interactions in the generalization setting throughout baseline and intervention in the general education classroom. Similar to the other triads, interactions for all participants increased immediately when the intervention was implemented.

**Social Validation**

Adult and peer participants rated the acceptability and perceived effectiveness of the intervention on a 5-point scale (i.e., 1 = not at all, 5 = very much). Results for those questions are provided in Table 7. All participants also answered several open-ended questions about their experience with the intervention. In response to open-ended questions, the adults talked about the target student interacting with everyone more often, and the target student becoming more engaged, interested, and involved in the class as a whole. For example, several of the adults talked about how the target students were more likely to volunteer to answer questions in front of the class and more likely to recruit help and attention after the intervention was implemented. Adult participants also discussed how the target students became more independent and required less adult oversight as the peers began to offer more embedded supports. For instance, one paraprofessional said that the target student was more likely to do something (e.g., raise his hand to answer a teacher’s questions, participate in a discussion) if prompted by peers than if prompted by the paraprofessional. All three of the general education teachers and one of
Table 7.

Results of Social Validity Interviews

<table>
<thead>
<tr>
<th>Adult Questions</th>
<th>Mean (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was this strategy effective in increasing interactions between [the target student] and their peers?</td>
<td>4.7 (4–5)</td>
</tr>
<tr>
<td>Was this strategy helpful to you as a teacher or paraprofessional?</td>
<td>4.4 (4–5)</td>
</tr>
<tr>
<td>Was this strategy easy to implement?</td>
<td>4.7 (4–5)</td>
</tr>
<tr>
<td>If you had a student with similar needs in the future, would you consider using this strategy again?</td>
<td>5</td>
</tr>
<tr>
<td>If another teacher had a student with similar needs, would you recommend this strategy?</td>
<td>4.9 (4–5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Peer Questions</th>
<th>Mean (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you enjoy helping [the target student]?</td>
<td>5</td>
</tr>
<tr>
<td>Was it easy to help [the target student]?</td>
<td>4.5 (4–5)</td>
</tr>
<tr>
<td>Do you learn things from helping [the target student]?</td>
<td>4.3 (3–5)</td>
</tr>
<tr>
<td>If asked, would you volunteer to do this again?</td>
<td>5</td>
</tr>
<tr>
<td>If your friend asked, would you tell them to volunteer for this?</td>
<td>5</td>
</tr>
</tbody>
</table>

Note. Means and ranges based on a 5-point likert type scale (i.e., 1 = not at all; 2 = not much; 3 = neutral; 4 = somewhat; 5 = very much).

the paraprofessionals admitted that they were skeptical at first, and were concerned that integrating the target students more fully would require a lot more effort. However, each adult participant said that, once implemented, the peer support arrangement made supporting the target student easier. As Ms. Grey put it, “having the peers to help takes a lot of the pressure off me, because I know they can help [Phillip] stay on track.”

Many of the peers commented on similar changes in the targets students’ behavior (i.e., increased willingness to volunteer, increased recruiting assistance). On average, the peers rated the intervention as easy to implement and all peers indicated they enjoyed the experience. For example, several peers indicated they enjoyed “getting to know [the target student] better,” and that they “enjoyed being helpful and helping someone.” Several peers also said that they learned meaningful things from the experience, for
instance Samiir said “I am really surprised that [Phillip] is so social.” Then he added, “he is really just like anyone in class, but I guess I didn’t think about it before.”

Each of the participants with IDD indicated that they enjoyed working with the peers and enjoyed being more involved with the class. Phillip said that “sitting with friends makes social studies class more fun.” Adrian indicated that he thought he was doing better in the class and felt like the class was easier after the peer support arrangement was implemented. All three participants with IDD indicated that they would like to sit in groups with those peers again in future classes.

**Discussion**

Previous research has demonstrated that peer support arrangements are an evidence-based practice for increasing interactions between participants with severe IDD and their peers in general education classrooms (Carter et al., 2016). In some cases, effects have also been demonstrated on academic engagement. However, it is unclear if and how instructional format impacts peer interactions, and if interactions with peers generalize to outside of the classroom. In this single-case design study, I implemented peer support arrangements for three middle school participants with severe IDD. I tracked interactions by instructional format in the classroom, and I measured interactions outside of the classroom (i.e., during lunch). Implementation of peer support arrangements coincided with increased interactions and academic engagement for all three students in the general education classroom. Effects did not automatically generalize to the lunchroom, but introducing a self-monitoring procedure for peers during lunch resulted in increased interactions for all three students. Findings from this study extend the literature in a number of key ways.
First, this study replicated findings from previous studies that peer support arrangements are an effective means to promote increased interactions in general education settings, and extends the literature by measuring differences in interactions across instructional contexts. Our findings indicate that different instructional formats may enhance the effects of a peer support arrangement in meaningful ways. Additionally, I demonstrate that simply designing group activities may be associated with increased peer interactions when compared to other formats. It is likely that the nature of the group work format, which instructs students to interact, may lead to more interaction. However, the combination of group activities and peer support arrangements have a substantially greater impact on peer interactions. For each of our triads, I recorded immediate therapeutic changes to higher levels of interactions during intervention across instructional formats. The largest gains in interactions tended to occur during group work and independent work. During group work and independent work the peer support arrangement plan clearly defines the peer’s role as aiding the student with severe IDD to participate and complete the assignment, prompting more interaction. Interactions occurring during teacher-directed activities saw a meaningful gain, but it was clearly more modest than in other formats. During teacher-directed time the expectation on all students in the class is to pay attention to the teacher, rather than interacting with their classmates. The supports identified in a typical peer support arrangement may include sharing notes, paraphrasing, or expanding on points in the teachers instruction; however, those supports are often given after the teacher-directed time has finished and the students have moved on to group activities or independent work.
Given that the specific classrooms included in this study did not utilize class discussion in a meaningful proportion of intervals (M = 2.2%; range: 0%–32.9%), I did not have sufficient evidence to evaluate its effects. Unstructured time also represented a very small proportion of our observations (M = 3.4%; range: 0%–13.0); therefore, the subsequent increase in the target behaviors seen during these times should be interpreted with caution.

Second, this study replicated findings from previous studies that peer support arrangements are an effective means to promote academic engagement for students with low engagement at baseline, and extended this finding by measuring differences in engagement across instructional contexts. Similar to the data on the primary dependent variable, the academic engagement of all three participants showed a clear therapeutic change that extended across instruction formats after implementation of the interventions. The magnitude of this change ranged between participants, relative to their baseline levels of academic engagement. For the two participants with lower and more variable baseline data, Adrian and Scotty, the therapeutic change was more evident and robust. One participant, Phillip, demonstrated a much more modest gain in engagement. One possible explanation for this is that Phillip displayed a higher baseline than the other participants. This may have been due in part to the fact that he had significant more interactions with adults (M = 36.8, SD = 16.9), mostly a paraprofessional assigned to work with him, than did either Adrian (M = 4.5, SD = 1.7) or Scotty (M = 13.6, SD = 4.1). Phillip’s modest gain in engagement accompanied a significant decease in his interactions with adults from a mean of 36.8% of intervals (SD = 16.9) in baseline to a mean of 9.3% of intervals (SD = 4.1) during intervention. This evidence supports the
claims of previous research that peer support arrangements may be an effective method of maintaining engagement while fading adult support. Across participants the largest gains in academic engagement were seen during independent work and group activities, mirroring gains in interactions. Again, more modest, but still significant, gains were recorded during teacher-directed time. The evidence from both the primary and secondary dependent variable suggest that one way teachers may better capitalize on the effects of peer support arrangements is to increase the proportion of group activities and independent work over more teacher-directed activities.

Third, the results of this study indicate that peer support arrangements are unlikely to impact peer interactions outside of the classroom without additional focused intervention efforts. Therefore, additional interventions implemented across environments may be needed to ensure that students with severe IDD continue to have opportunities to interact with their peers throughout the school day. There may be several explanations for this lack of generalization. Taking from the reports of peers involved in this study, the cause may be as simple as the competing contingencies of socializing with other general education peers. For instance, many peers indicated that they typically chose to sit with their established friend groups (e.g., other peers from sports teams, peers that live in their neighborhood, peers they know from elementary school). Interacting with other general education peers with longer common histories may be more immediately reinforcing. In addition, interacting with students with limited communication repertoires and/or deficits in social skills may simply take more response effort from the peers. Several peers commented on how the target students were difficult to understand at times or that some target students used repetitive phrases frequently.
It is also possible that different environments, like less structured environments, have different social reinforcing and punishing consequences contingent on peer interactions than are present in the classroom. Anecdotally, I recorded numerous times that peers were praised by adults in the classroom for interacting well with the student with a severe disability, where that third party social reinforcement did not occur in the lunchroom or in the recess yard. Likewise, although I did not observe evidence of this, it is possible other general education peers could actively punish interacting with students with severe IDD. It is also possible that peers could avoid interactions with students with IDD out of a perceived threat of social punishment.

Finally, despite the lack of generalization, this study extends the literature by providing a simple and feasible method for increasing interactions across environments for students involved in a peer support arrangements. The self-monitoring strategy added to the traditional peer support arrangement provided an easy way for a facilitator to direct the peers to change their behavior in the non-classroom environment without the need for a large amount of additional training.

**Implications for Practice**

Our findings have two important implications for special and general education teachers collaborating to support students with severe IDD in a range of inclusive settings throughout the school day. First, given the lack of generalization of peer behavior outside of the intervention environment, teams planning to support inclusion for students with severe IDD should use strategies to promote generalization to other non-classroom settings. This could entail implementing a peer support arrangement—like that utilized in this study—in each of the target student’s general education classrooms and
supplementing that in class support with additional strategies in less structured environments.

Second, practitioners most effectively promote peer interactions by simultaneously designing instruction that features more group activities and by introducing peer support arrangements. After establishing how much of each instructional format occurs, purposely modifying instructional planning to devote more time to partner and small group collaborative work and less time to a teacher-directed format may enhance the efficacy of a peer support arrangement. This recommendation must, of course, be balanced with the teacher’s preference and the demands of the subject matter. I am not suggesting that teachers eliminate all teacher-directed activities, because our finding indicate that peer support arrangements can lead to increases of format.

Limitations and Future Directions for Research

There are several limitations of this study that merit discussion and suggest avenues for future research. First, this study was meant to examine the interactions between students with severe IDD and their peers broadly in order to accurately track the behavior of multiple individuals at once. This study only implemented the intervention in one classroom setting and evaluated generalization in one non-classroom setting. In order to evaluate the efficacy of a more comprehensive inclusion support plan that is implemented across school environments.

Given the scope of the study, I chose to focus only on frequency of interactions, rather than including a measure of quality, which limits the interpretation of our findings. From a social validity perspective, increasing the rate of interactions is only important if those interactions are of sufficient quality. Increasing the amount of times a peer

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criticized a student with a disability or reluctantly agreed to work with that student would not be beneficial to either student. Future research may want to consider interaction quality as a primary dependent measure.

I used very broad categories to code instructional format (e.g., independent work, group work) that limited the sensitivity of the measure. This measure could be improved upon and made more sensitive in future studies for an even more in depth look at the effects of context on peer support arrangements. A more complex system could expand broad categories into additional options. For example, instead of a single choice for group work, the category could be divided into partnered work, small group (i.e., 3–4 students), and large group (i.e., 5+ students). Likewise, the teacher-directed format could be expanded to include codes for what the teacher is doing specifically (e.g., lecturing, answering questions, reading from a text).

A final limitation comes from the fact I decided to collect data on the engagement of the target students, but due to the amount of variables, I did not collect the same information for peers. Knowing how a peer support arrangement affects a peer’s engagement with the academic demands of the instruction is valuable information that could inform recommendations for the use of peer support arrangements. Future research may want to track additional variables for each of the participant peers, including engagement and that peer’s interactions with adults and other general education peers. These studies should, of course, continue to collect target student data as a secondary measure to ensure that the peer support arrangement benefits all students.
Conclusion

The results of this study show that peer support arrangements can enhance peer interactions for students with severe IDD across instructional formats (e.g., list examples here). In addition, effective classroom-based peer support arrangements do not automatically promote increased interactions outside the classroom, but a simple and feasible self-monitoring strategy for peers can improve these outcomes. Previous studies have already established that peer support arrangements are effective, but this study demonstrates how one might to extend positive outcomes beyond the classroom; this study was successful in two settings, but nothing prevents the implementation of this intervention across all setting throughout the school day. Such an approach would have a profound impact on the lives of students with severe disabilities.
Chapter 4: Practitioner Paper

This chapter contains a practitioner paper based on the recommendations drawn from chapters 2 and 3. It is written to an audience of practitioners and intended to provide a practical implementation guide.

Abstract

Supporting the inclusion of middle and high school students with severe disabilities can be an extremely challenging task. This challenge is confounded by the fact that a successful inclusion support program in one environment, may not improve a student's outcomes in a different environment. This paper presents a framework for supporting the inclusion of students with severe disabilities across school environments by creating a team of professionals and peers and planning multiple interventions targeting different environments. We also include easily accessible descriptions of evidence-based assessment and intervention strategies along with references to other tools and practitioners guides.
Where Everybody Knows Your Name: Promoting Social Connections Across All School Environments for Middle and High School Students With Severe Disabilities

Mrs. Prince, a special educator, has been collaborating with the seventh grade science teacher, Ms. Grey, to support their student Adrian in the general education science class. Adrian has autism and has struggled to form relationships with children his own age. To help him branch out, Mrs. Prince invited a couple of Adrian’s peers from science class, Alex and Andre, to participate in a peer support arrangement. After they met to set goals and make a plan to support Adrian, and Mrs. Prince met with the peers to orient them to their new roles, the teachers were very pleased with how well all three boys helped each other be more engaged in class. Watching them work together on a lab experiment one day for a half an hour, Mrs. Prince finally felt like Adrian was building some friendships with his peers. To see how this friendship was growing, Mrs. Prince decided to follow the students from science into the lunchroom. Much to her dismay, she watched as Andre walked right past Adrian as if he didn’t even know him. After lunch, Mrs. Prince followed Adrian to study hall and was discouraged to watch Adrian sit alone by himself as Alex and Andre sat and talked with a large group of boys.

Forming and maintaining friendships over time fills a basic human need and improves one’s quality of life. However, students with severe disabilities—such as autism spectrum disorder (ASD), intellectual disability (ID), and multiple disabilities—struggle to build friendships at school at and outside of school (Wagner, Newman, Cameto, Levine, & Marder, 2003). This lack of socialization can lead to lower rates of community involvement and high rates of adults with ID reporting feelings of loneliness (e.g., Gilmore & Cuskelly, 2014). On the other hand, research indicates for some students
with severe disabilities, building a strong social network of peers can be a protective factor against social isolation and exclusion (Lindsay & McPherson, 2012). Furthermore, Copeland and colleague (2004) suggest that general education peers may learn valuable character lessons from working with students with severe disabilities in inclusive settings.

Although researchers have identified several promising approaches for promoting social interactions and connections, they have also found that implementing a single approach in a single classroom is unlikely to impact the student in other classrooms or outside of the classroom (chapter 3). Therefore, it is critical for teachers to purposely design supports that enable students with severe disabilities to successfully interact with their peers across school settings. This paper outlines recommendations for designing a comprehensive plan to promote for social outcomes. A comprehensive approach requires planning and coordination across adults, and effective implementation of multiple approaches across environments. The proposed framework consists of three major components: delivering effective communication and social skill instruction to the student with severe disabilities, inviting and coaching peers to provide natural supports, and modifying the environment to create and improve contexts for interaction and participation. Figure 4 provides an overview of these components.

**Planning as a Team**

Research suggests that collaboration, including team planning and team service delivery, can be a powerful tool for supporting inclusion (Santoli, Sachs, Romey, & McClurg, 2008). In their two-year longitudinal study of young adults with ID, Robertson and colleagues (2006) found that a coordinated multi-disciplinary team planning a service delivery approach that focused on the needs of the individual was more efficient
and effective than a central service provider in a standardized program. To harness the power of collaboration for inclusion, a team needs a strong commitment to making inclusion successful, time to plan and evaluate collaboratively together, and strong administrative support for resources and access to inclusive placements (Santoli et al., 2008).

The first step in building a successful team is for the special educator to recruit general educators who are interested in supporting inclusion. To secure the cooperation of other team members, special educators need to consider their perspectives and

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*Figure 4.* Concept map of a comprehensive inclusion support plan.
concerns. For example, many general educators, paraprofessionals, and administrators view their own lack of training and experience with students with disabilities as among the primary barriers to inclusion (Santoli et al. 2008). Given their training and experience in supporting individuals with disabilities special educator can address their team members by being open and vocal with their knowledge. Mastropieri and colleagues (2005) also suggest that successful collaboration requires all team members to be willing to share decision making and service delivery, which requires trust and mutual respect. After recruiting other team members, special educators should meet with their new team to set goals for their target student, discuss the shared responsibility for those goals, and make plans to monitor progress and meet regularly to discuss progress on those goals.

After setting goals and discussing shared responsibility, teams need to choose specific strategies to support inclusion and collaboratively plan how to implement those strategies. The remainder of this paper will provide an overview of a number of evidence-based practices grouped into three different approaches that a collaborative team can take to create a comprehensive inclusion support plan. Figure 5 provides a template for teams to use to start structuring their own three-point plan.

**Using Assessment and Instruction for the Student With a Disability**

The first approach in a multi-pronged comprehensive support plan is to deliver instruction on communication and social skills to the student with severe disabilities, referred to as the target student, that will improve his or her ability to successfully and appropriately interact with peers. For example, a student who rarely initiates interactions can be taught to appropriately recruit the attention of their peers as one way to increase
Figure 5. Blank template for a comprehensive inclusion support plan
the how often that student interacts with classmates. Other important social and communication skills teachers may want to target include, but are not limited to, conversational turn-taking, greeting new peers for the first time, using standard greetings with familiar peers, using appropriate distance and volume when speaking, and repairing communication breakdowns. Do not think of these skills as the prerequisites to entering an inclusive setting; rather, use these setting to develop and enhance these skills.

Peers and general education teachers may find moderate to severe deficits in communication skills particularly challenging when interacting with students with severe disabilities. An effective first step in a comprehensive plan could be systematically teaching the student to use an augmentative or alternative communication (AAC) system. For a student with a mild to moderate impairment (e.g., poor articulation), AAC support may be as simple as teaching the student to supplement their verbal speech with natural gestures or visuals. For example, when a student is asking for something, they could be taught to point to the thing they need while saying the request.

In the case of a more severe impairment (i.e., very low intelligibility or not using verbal speech), a student may need to learn an alternative method of communicating, such as using sign language or a speech-generating device (SGD). Learning alternative methods of communication can be challenging, so teachers should use both explicit teaching methods (e.g., discrete trial training) and naturalistic interventions (e.g., milieu strategies) to support their students (Rispoli, Franco, van der Meer, Lang, & Camargo, 2010). For a student with limited communication skills and limited physical mobility, a teacher may also need to consider alternative ways a student could access an SGD, such as teaching a student to use a switch. Schaefer and Andzik (2016) provide a step-by-step
practitioner’s guide for teaching a student to use switches to access other technology.

To better understand their student’s current communication skills and areas of need, teams can use one of several research-based assessment tools. For students who are not regularly using AAC or verbal speech to communicate, Sigafoos, Arthur-Kelly, and Butterfield (2006) provide a practical guide for using the Inventory of Potential Communicative Acts (IPCA). The IPCA combines an indirect assessment (i.e., parent/teacher interview) with a direct assessment (i.e., structured observation) to assess what subtle communicative behaviors a student is engaging in that can be capitalized on and shaped into recognizable acts. For students who are already using some form of AAC, Chung and Douglas (2014) present a practitioner guide to using the Communicative Competence Inventory (CCI). The CCI was developed to help teams identify specific communication challenges for AAC users, so that as a student continues to gain skills, the team can set more ambitious goals for growth.

**Using Peer-Mediated Interventions**

Although it is important to focus on improving the communication and social skills of students with severe disabilities, it is equally important to focus on the peers with whom they could interact and build social connections. Peer-mediated approaches have the potential to benefit both students with severe disabilities and the peers without disabilities who provide support. Specifically, peer-mediated interventions can enable students with severe disabilities to learn from positive peer models, practice communication and social skills in a natural context, and participate more fully in general education settings. These approaches can also help peers to interact with students with disabilities, learn communication skills, and practice support skills. Peers who participate
have reported enjoying their participation, and have reported feeling good about helping another person.

Two peer-mediated interventions in particular have been shown to be effective in increasing interactions between peers and their classmates with disabilities including Peer Support Arrangements and Peer Networks. Get more information about the research backing these evidence-based practices in Figure 6.

<table>
<thead>
<tr>
<th>What Does the Research Say?</th>
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<tbody>
<tr>
<td><strong>Peer Support Arrangements</strong></td>
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<tr>
<td><strong>Peer Networks</strong></td>
</tr>
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</table>

*Figure 6. Research support for peer-mediated interventions.*

**Peer support arrangements.** Research provides a number of examples of special educators and paraprofessional who have successfully implemented this evidence-based practice to support students with a range of needs and abilities in a range of inclusive settings (e.g., Carter et al., 2016). In a peer support arrangement, an adult facilitator (e.g., teacher, paraprofessional) recruits one to three peers in a general education classroom and
orients them to their role of offering natural supports to the student with disabilities (Carter et al., 2016). The facilitator and peers collaborate to make a support plan for the classroom. Then, the facilitator coaches the peers on implementing the plan while fading out working directly with the student with disabilities. See Carter and colleagues (2015) for a step-by-step practitioners guide to implementing a peer support arrangement in the classroom.

**Peer networks.** Moving outside of the general education classroom, peer networks can be used to increase interactions between students with severe disabilities and their peers non-academic settings such as lunch, recess, or after school clubs. To implement a peer network, an adult recruits peers, orients them to their role as social supports, and facilitates regular meetings in which peers discuss and reflect on their role of socially supporting the target student (Hochman, Carter, Bottema-Beutel, Harvey, & Gustafson, 2015). During these meetings peers plan social events, talk about their goals for providing social supports to the target student, and problem solve any challenges they are having socializing with the target student. See Carter and colleagues (2013) for a user-friendly guide to forming and maintaining a peer network.

Peer networks are effective when used independently or they can be used in tandem with peer support arrangements. In fact, recruiting some peers that overlap in other interventions and encouraging them to invite friends into the peer network could continue to build a broad and strong social network for the student with a severe disability. For a case study example of what these strategies might look like, separate and combined, see Figure 7.
Peer Support In Practice: Ernie, Sam, and Diane

Ernie is a 13-year-old seventh grader with an intellectual disability who attends Lakeside Middle School. Ernie is in general education classes for science, language arts, social studies, physical education, and art. He also spends three periods a day in Mr. Boyd’s resource room where he has math class and works on other specific IEP goals.

Sam is also 13 years old, does not have a disability, and is in Ernie’s science lab group. At the beginning of the semester, Mr. Peterson, their science teacher, invited Sam to participate in a peer support arrangement for Ernie. After brainstorming ways to help Ernie and making a plan together, Sam and the other two kids in their lab group do a great job supporting each other. Sometimes they share their notes with Ernie. Sometimes they take turns reading out loud to help Ernie, who really struggles with reading from the science textbook. Sometimes when the class is answering questions out loud, they help Ernie make sure he has the right answer before he raises his hand. Most of the time though, they just enjoy joking around with Ernie.

Diane is 12 years old and in seventh grade as well. She has language arts class with Ernie. One of her favorite activities in class is when all the students pair up for peer tutoring to answer questions about the book they are reading or brainstorm ideas for writing. She really enjoys when she gets paired with Ernie. He always has really creative and fun ideas for stories. Sometimes she has to help Ernie with his spelling and grammar, but she doesn’t mind; helping him makes her feel good and her teacher always compliments how well they work together.

Diane and Sam frequently sit near Ernie at lunch and every two weeks they and a couple other seventh graders eat lunch in Mr. Boyd’s room. Mr. Boyd calls their group a peer network and they talk about different ways they might help Ernie make even more friends at school. Sometimes they plan a get together after school and sometimes they just talk about how everyone at the lunch table is getting along. Once in a while, one of the kids will have a question about something different Ernie does, or what to do when they can’t understand something Ernie says, or what to do when Ernie just isn’t understanding something in class. Mr. Boyd is really good at talking those things out. He is also really good at helping the group understand more about how everybody is different and how that's a good thing.

Figure 7. Case study of peers participating in overlapping interventions.

Modifying the Environment and Changing the Adults Behavior

After planning explicit instruction to meet the target student’s specific needs and enlisting a community of peers to offer natural social and academic supports, teachers can enhance both of those efforts by creating and improving contexts for interaction.
Foremost for a student with severe disabilities, having an educational placement that allows access to and plans time in inclusive settings is a natural prerequisite to interacting with peers. If a student’s placement does not currently allow for any time in a setting with general education peers, inclusion-planning teams need to make increasing access and time spent in inclusion a priority. To do this, special educators must listen to and address the concerns and needs of the general education teachers and administers who often act as gatekeepers to these inclusive environments. Coming armed with evidence dispelling the common myths of harmful side effects and a thorough understanding of evidence-based practices to support inclusion will make that advocating easier and more successful.

Once a target student is placed in a general education classroom, individual teachers can create more opportunities for peer interaction and practicing important social and communication skills by prioritizing heterogeneous instructional groupings and planning more interactive activities (e.g., whole or small group discussion). Schaefer, Cannella-Malone, and Brock (in progress) demonstrated that peer support arrangements were effective in increasing peer interactions and academic engagement for students with severe disabilities across a range of instructional formats; however, the largest gains were observed during group activities and when students were directed to work independently. These activities may maximize opportunities for the peers to offer natural supports within the context of classroom expectations. One way teachers may be able to get the most out of a peer-mediated intervention is to increase the balance of instructional formats throughout their instructional time. Given that more modest, yet significant, increases were also observed during teacher-directed instruction, we do not recommend that teachers omit that format altogether.
Including students outside of the general education classroom also provides valuable opportunities for target students to interact with their peers. For example, teachers might want to focus on ensuring that the target student is in the hallway at the same time as their peers during passing periods. The inclusion support team might also want to help the target student join clubs and teams with their peers that match their interests. Finding and recruiting peers who are already participating in those teams and clubs to also participate in a peer support arrangement or peer network for a specific target student may create another opportunity for peer partners to be tied back into a comprehensive inclusion support plan.

Direct adult facilitation is another method of enhancing inclusion by changing adult behavior and the environment (Causton-Theoharis and Malmgren, 2005). Both peer support arrangements and peer networks provide defined facilitative roles to adults; however, direct adult facilitation can be less formal, done by any adult in the environment, and simply involve incidental teaching of social skills to promote interactions. To capitalize on these incidental teaching moments, adults would prompt students with severe disabilities to interact with their classmates and vice versa. Examples of this strategy can be as simple as a teacher redirecting a target student’s question on an assignment to a peer, a teacher prompting a peer to assist a target student with a specific task, or a teacher asking a peer to serve as a model for teaching a target student specific skills.

**Conclusion**

A special educator attempting to support the social interactions and connections for students with severe disabilities across a board caseload and across a range of
environments simultaneously faces a tall order. Only by leading the combined efforts of multiple team members—general educators, paraprofessionals, and peers—could that single special educator be able to provide the comprehensive support needed to ensure the meaningful social inclusion students with severe disabilities across all school environments. Research provides effective models of comprehensive support plans (e.g., Hunt et al., 2003; Hunt et al., 2002), good evidence validating specific support strategies (e.g., Carter et al., 2016, Hochman et al., 2015), and good practitioner-oriented step-by-step guides for those practices (e.g., Carter et al., 2013; Carter et al., 2015). By utilizing these evidence-based practices in the three-point support framework provided in this article, inclusion-support teams are more equipped than ever to improve social outcomes for students with severe disabilities and their peers. Regardless of the abundance of resources available, the linchpin of a comprehensive inclusion support plan, however, is still the special education teacher who will lead that team.
Chapter 5: Discussion

The preceding three chapters of this dissertation focus on the existing research literature on peers’ involvement in peer-mediated interventions for students with severe disabilities, my own research study that extends that literature, and recommendations for practitioners that stem from both my study and the existing literature. In this chapter, I will describe my career goals, the specific aims of my research line on peer-mediated intervention, how the three preceding chapters relate to these aims, and how my future research will further address these aims.

Career Goals

As a special education teacher, I had many formative experiences watching students with bright and engaging personalities struggle to make connections with the general education students around them. As I advocated for these students, I repeated the traditional mantra of inclusion: students with disabilities have a right to and should be included because it benefits them academically and socially. With that one-sided perspective of inclusion (i.e., concerned only with the perspective of the student with disabilities), I overlooked the basic fact that relationships are bilateral by nature. It takes two people to interact, and each individual needs to have his or her efforts reinforced for that interaction to be maintained over time and to generalize across environments. Through my career as a teacher and graduate student, I have come to believe that the
traditional arguments of human rights and potential benefits for students with disabilities are necessary pieces, but are not sufficient alone to drive systemic change. Moving forward, I want to contribute to a new narrative that provides general education teachers, peers, and parents with additional evidence as to the potential benefits of inclusion. Furthermore, I want to show how including students with diverse abilities and needs can build a better community at the classroom and school levels. I believe that knowledge will contribute to more inclusive communities at the societal level. I plan to do this by continuing to conduct research on peer-mediated interventions and disseminate the findings of this literature through practitioner oriented writing, presenting at national and local conferences, providing professional development to schools, and most importantly, through teaching future general and special education teachers at a collegiate level.

**Research Aims**

To move toward my goal of enhancing the rationale for inclusion, my research in peer-mediated intervention will focus on four specific aims. First, I am interested in how implementing peer-mediated interventions in specific settings impacts the communication behaviors and social outcomes for students with severe disabilities and their peers in other environments. As these evidence-based practices (e.g., peer support arrangements, peer networks) become more widely adopted and implemented in schools, I want to contribute to an evolving literature that can offer recommendations for programming for generalization from the initial planning stages.

Second, I want to explore the long-term maintenance effects of peer-mediated interventions on the behavior of both students with severe disabilities and their peers. Much like generalization of interactions across environments, the continuation of
interactions over time (e.g., across a school year, from year to year) is an essential aspect of improving adult outcomes for students with severe disabilities. To achieve this long-term maintenance, it is essential to create peer-mediated intervention strategies that do not require long-term adult facilitation. Rather, stimulus control of the interactions between the students must be transferred to the natural environment.

Third, I am interested in continuing to explore the impact of peer-mediated interventions on the peers involved. I want to better understand how naturally occurring social contingencies act on the peers within the context of interacting with students with severe disabilities. This will help me provide recommendations for removing barriers to peers’ interest in participating in peer-mediated interventions and help me provide problem-solving recommendations for practitioners implementing peer-mediated interventions in applied settings. I also want to better understand the potential benefits to peers to help me make recommendations for structuring environments that maximize potential for reinforcement for peers, as well as supply special educators with evidence to use to advocate for greater inclusion.

Finally, I am interested in testing methods for teams of special educators, general educators, and paraprofessionals to collaboratively plan for, progress monitor, and make decisions about supporting inclusion. Especially given the negative findings on generalization of interactions presented in chapter 3, it is likely that more comprehensive planning will be necessary to encourage increased interactions for students with severe disabilities across the school day. More comprehensive planning will require special educators to coordinate more interventions with more team members. Understanding
better how that collaboration works will help me make recommendations for collaborative planning, progress monitoring, and decision-making.

**The Development of This Dissertation**

This dissertation began in the first year of my doctoral program with the systematic literature review presented in chapter 2. Having implemented peer-mediated interventions as a teacher and having studied peer-mediated interventions as a graduate student, I knew I was very interested in the topic. However, the more I read comprehensive reviews on supporting interactions of students with intellectual and developmental disabilities (e.g., Carter & Hughes, 2005; Carter et al., 2010), the more I struggled to find a place to meaningfully contribute something novel to the literature. After several rabbit holes, dead ends, and conversations with mentors and colleagues, I decided to explore the question of the treatment of peers in the peer-mediated intervention literature. Through the review, I was consistently surprised at the lack of information provided on peers, both for their background information and for their outcomes. Unfortunately, I found that the literature has not yet amassed a large body of knowledge about peer outcomes. Although researchers have begun to build evidence against the myth of harmful side effects of inclusion, I found that they have not yet delved deeply into potential benefits. Furthermore, there are still glaring gaps about some of the more basic effects of these interventions. I was surprised that, despite evidence of primary effects, researchers have not looked deeply into the issues of maintenance and generalization of peer behaviors as a result of these interventions. For example, we do not yet have a comprehensive understanding of how different environments and contexts affect peer interaction behaviors.
Consequently, I decided to focus my energy for this dissertation on specific questions related to the impact of contextual variables on the effects of peer support arrangements. I designed an experiment, presented in chapter 3, to examine how different environments (i.e., structured v. unstructured) affect these interactions between students with significant disabilities and their peers and, furthermore, how context within the classroom environment (i.e., instructional format) affects that behavior. Throughout the study, I was encouraged to see that all participants increased their interaction behavior across instructional formats. Likewise, the clear pattern of increases being more pronounced in specific formats (e.g., group work, independent) also intrigued me. That finding began to provide meaningful evidence I could use to make recommendations to practitioners on how to modify instruction and the environment to maximize the effects of a peer support arrangement. On the other hand, as the study progressed, I was discouraged to see no signs of generalization. It was actually quite painful to watch Scotty and Brody work together talking and laughing in a group for half of science class during 4th period and then, 10 minutes later, watch the two pass each other in the lunch line without even a spark of recognition.

From the research study, I had two major findings to choose from for the focus of the practitioner paper. First, I considered a practical guide for planning to increase class time spent in the instructional formats that encouraged more peer interactions. The teachers that I worked with on this project already planned good balance of instructional formats. Consequently I chose to focus on the findings on generalization to create a practitioner paper focused on coordinating interventions across multiple environments.
Future Research

As I move forward in my career, I plan to pursue my research aims in a number of specific ways. First, I plan to further study how the promising social outcomes that result from implementing peer-mediated interventions in one setting can be generalized to other settings. The previous literature does little to address this important issue, and I learned in my study that regardless of the success of an intervention in a structured classroom setting, unique environments would likely need dedicated supports. Several important questions are left unanswered, including whether there is a way in which a team could program for generalization enough to support spontaneous generalization into novel environments. For example, to apply the concept of using multiple exemplars, I could conduct a study to assess whether interaction behaviors would generalization into a novel environment if a team were to implement peer support arrangements with the same peers across several general education classrooms. Also of interest, I want to more deeply explore the contextual variables that make unstructured settings different than classroom settings. During my assessment of the social validity of the research study, many of the peers talked about why it is hard to interact in the cafeteria and at recess. However, given that these less structured settings more closely mirror many of the environments students will transition to in adulthood, understanding the contingencies at work is essential for promoting better long-term outcomes.

Likewise, I intend to further study how the promising social outcomes resulting from peer-mediated interventions can be extended to maintain across time. This issue is closely tied to generalization, but unique in that I am interested specifically in the systematic fading of adult support to attempt to transfer stimulus control entirely to each
of the partners. Thus far, the literature does not provide examples of fully-withdrawn interventions and long-term measures of interactions. In my study, the adult facilitators were consistently reinforcing the students’ interaction behavior in the general education classroom setting. These contrived contingencies are simply not as widely available in less structured settings and in many adult settings. To better understand how much the success of these interventions rely on continued adult mediation, I plan to pursue research that systematically fades adult facilitation to a complete withdrawal and then continues to probe for results months afterwards.

To accomplish the research aims of maintenance and generalization, it will also be necessary to further explore peer perceptions and preferences in their relationships with the students with disabilities. Questions remain about what specific social behaviors reinforce peers’ interaction behavior with their classmates with disabilities and the extent to which student with disabilities engage in those behaviors. Likewise, questions remain about the impact of increased response effort on the part of peers due to specific social and communication deficits of students with disabilities. In my study, many of the peers discussed how they struggled with the target students’ communication skills (e.g., poor articulation, use of repetitive phrases, limited verbal repertoire). If I could isolate the salient variables more specifically, I could create interventions to target recruiting and engaging in those specific reinforcing behaviors and creating effective problem solving strategies to reduce response effort. Again, the ultimate goal would be to train students with disabilities and peers to access those naturally occurring reinforcers.

Finally, although the ultimate goal of these interventions is to build relationships that maintain on their own, it is also necessary to focus on the initial intervention
provided by adults. If programming for generalization and maintenance of peer interactions requires comprehensive planning that spans across multiple team members, multiple environments, and multiple groups of peers, I would be asking a lot of classroom teachers who are already likely stretched thin. To ensure that any findings of this line of research are practically applicable in a K-12 setting, it will be necessary to study how teams led by special educators collaborate to accomplish these goals. Studying these questions would require coaching teams in implementing comprehensive inclusion support plans and then assessing the common challenges faced by those teams. Through this process, I could start to formulate recommendations for increasing the efficacy and efficiency of this planning process, as well as formulate problem-solving.

Conclusion

Throughout my career, I will continue to pursue research and teaching on supporting successful inclusion through building supportive classroom communities of peers and general education teachers. Specifically, I plan to focus on the issues of generalization and maintenance of interaction behavior from the perspective of both the students with disabilities and their peers. To do this, it is necessary to dig deeply into the experience of the peers, examining the challenges they face and the benefits they reap while building relationships with their classmates with disabilities. It is my belief that providing students with significant disabilities access to supportive inclusive environments will add a rich diversity to our classrooms. I believe that this will contribute to a culture that is more informed about and supportive of services that individuals with special needs require both in schools and in the community.
References


Schaefer, J. M., Cannella-Malone, H. I., & Brock, M. E. (in progress). The effects of peer support arrangements on interactions between students with and without significant disabilities across environments.


Wagner, M., Cadwallader, T. W., Marder, C., Newman, L., Garza, N., & Blackorby, J. (2002). *The other 80% of their time: The experiences of elementary and middle school students with disabilities in their nonschool hours*. Special Education Elementary Longitudinal Study.


Appendix A: Parent Permission Forms
The Ohio State University Parental Permission/Consent
For Child's Participation in Research


Helen I. Malone, PhD, BCBA-D

John Schaefer

This is a parental permission form for research participation.
It contains important information about this study and what to expect if you permit your child to participate.
Your child's participation is voluntary.
Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose:
The aims of this research are to support the inclusion and well-being of students with intellectual and developmental disabilities (IDD) in our communities' schools. We plan to do this by providing peers with information and strategies on how to best interact with and support students with IDD.

Procedures/Tasks:
Children with IDD who volunteer to be part of this study will not be asked to do anything additional for this study, except for a short (approximately 10 minute) interview at the beginning and end of the study. Their social behavior will be observed and recorded several times a week.
Peers participating in this study will be asked to attend two training sessions, lasting about 20 minutes each, in which they will be receive information about the student with IDD in their classroom, participate in discussions about how they can positively interact with these students, and learn strategies to help include these students into the general education classroom. Peers will also be asked to keep a daily log where they record a goal for the day and report how they feel they did on that daily goal. In addition, peer will periodically meet with a researcher several times a week, for approximately five minutes, to talk about how the program is going and have an opportunity to talk about any problems they are having. Peers will be interviewed at the beginning and end of the study as well.
For students with a disability, by the nature of being in their special education classroom we will see your student's school records. We will gather information on your student's diagnoses and scores. All effort will be made to maintain confidentiality. Their name and any identifying information will be stripped from their data at the conclusion of this study and will not appear in print in any form.

Duration:
This study is planned to take place between December of 2015 and June of 2016. All data collection for this study will end no later than the last day of your student's school year.
Your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

Risks and Benefits:
There is always a chance when children are socializing that they may feel awkward and uncomfortable. This risk may be heightened when students are interacting with someone who may not act or sound differently than themselves. However, the benefits of creating new and unique relationships and creating more diverse and better supported classrooms far outweigh the risks of temporary discomfort. Social and emotional risks do and will continue to exist in inclusive classrooms. One aim of this study is to help minimize these risks by increasing awareness and providing peers' strategies to support their classmates with IDD.
In addition, when implementing interventions in an academic setting there is always a risk that the added demands could impact students' academic performance or on-task behavior. However, there is strong evidence that peer-mediated interventions do not negatively impact peers' academic performance and may actually improve their engagement in the classroom.

Confidentiality:
Efforts will be made to keep your child's study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child's participation in this study may be disclosed if required by state law. Also, your child's records may be reviewed by the following groups (as applicable to the research):
- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Incentives:
No additional incentives will be offered to students for participation in this study, beyond the natural benefits of forming new relationships with new children in their classroom.
Participant Rights:

You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:

For questions, concerns, or complaints about the study, or you feel your child has been harmed as a result of study participation, you may contact John Schaefer at (419) 351-3384.

For questions about your child’s rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-860-678-6251.
Signing the parental permission form

I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject

Printed name of person authorized to provide permission/consent for subject

Signature of person authorized to provide permission/consent for subject

Relationship to the subject

Date and time

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining permission/consent

Signature of person obtaining permission/consent

Date and time

Page 4 of 4 Form date: 06/03/13
Appendix B: Behavior Coding Manual
Behavior Coding Manual

**Purpose of Project**
The aim of this research is to extend the existing literature on peer support arrangements by focusing specifically on supporting the generalization of peer interactions to environments outside of classrooms. Toward this aim, my research questions are:

- What are the effects of a peer support arrangement on social interactions of students with severe disabilities and their peers in inclusive classroom settings?

- What are the effects of training peers to use a self-management strategy on the social interactions between students with severe disabilities and their peers in school settings outside of the classroom?

**Experimental Phases**
This study will begin with a baseline phase in which we observe participants with severe disabilities (referred to here after at the target student), in two settings without any intervention. The first setting will be an inclusive general education classroom and the second is an unstructured school setting (e.g., cafeteria, study hall). Once we have established a consistent picture of how our target student interacts in these settings (i.e., a minimum of 5 observations in the general education environment without an increasing trend) then we will choose one target student with which to start intervention. Previous research indicates that we should see an initial increase in the interaction between the target student and their peers. If we do see that consistently (i.e., for at least three observations) we will begin intervention with the second group and so on.

**Observation Intervals**
Observations will last the length of a class period, which will be between 40 and 50 minutes depending on the school’s specific schedule. To record data we will observe the student(s) for 10 second, and then record their behavior for 10 seconds. We will use an app (e.g., interval timer) on our phones to cue us when to be watching and when to be writing.

**Type of Recording System**
We will collect data on paper (form attached) and I will transfer it to excel. To record on a behavior, simply place an ‘x’ or a check mark in the corresponding box. Our coding system is a partial interval recording system, which means that a behavior is recorded if the participants do that target behavior at any point during the interval. If the behavior occurs during the 10 seconds you are supposed to be recording, then ignore the behavior. The only exception to this is the engagement variable that will be recorded if the student consistently displays the engagement behavior, defined later, throughout 9 out of 10 seconds of the interval.
If the target student leaves the room and is not present for a given interval, draw a line through that interval to indicate you could not observe them.

Observation Checklist

• On the top of the form, fill out your initials, the time and date of the observation, how long the observation lasted in minutes, whether or not you were a second observer, and the setting in which the observation took place. Also indentify the participants by their code, which is the participant’s initials plus building code. For example, observing John Schaefer at Lincoln High school would appear as JSLHS.
• Being the observation as soon as soon as the class bell rings by starting the interval timer and starting an observation interval.
• After the initial 10 second observation interval, record what behaviors you observed and what for the timer to cue you to observe again.
• After eight minutes, you will need to take out a second recording sheet and start at interval 1 on the second sheet. To keep data sheets in order, circle the page number in the box at the top.
• Continue the cycle of observing and recording until the bell rings again.
• If the target student leave the room and is not present for an entire interval, draw a through all code boxes for that specific interval. Do this repeatedly if necessary until the student returns.

Definitions, Examples, and Non-examples of Behavior Codes

Target Student Interaction: A target student interaction is recorded when the target student (i.e., student with severe disabilities) uses verbal or nonverbal (e.g., gestures or signs) communicative behavior directed at either trained peers, untrained peers, or adults. Behavior directed towards these different groups are coded by recipient. For this study, we will be coding interactions directed toward untrained peers (i.e., all peers in baseline), trained peers (i.e., those who were trained on the peer support arrangement, and adults (e.g., teacher, paraeducator). A student can have interactions will all three in one interval. This definition includes the use of augmentative and alternative communication systems, such as PECS and speech generating devices (SGD).

Examples:
• The target student asks an adult for a pencil either by speaking “can I have a pencil,” using a sign for pencil, or exchanging a PECS symbol for pencil.
• The target student smiles and waves to a peer who is entering the room.
• The target student calls a peer by name to gain their attention.
• The target student answers an adults question by activating an icon on their SGD.

Non-examples:
• The target student is asked by a peer to hand the peer some paper, and the target student passes the paper without saying anything or making eye contact.
• The target student is greeted by a peer saying “hello John,” and the target student does not respond but continues to look down.
• The target student makes a comment not directed at anyone, for example if the target student were sitting alone looking out the window at a snowy day and said “wow, it is snowing hard outside.”

Peer Interaction: A peer interaction is recorded when a peer, trained or untrained, uses verbal or nonverbal (e.g., gestures or signs) communicative behavior directed at the target student. Peer interactions will be coded according to the participant who is communicating. During baseline all peer interactions will be recorded as untrained peers. After intervention, interactions of the two peers that have been trained will be coded separately.

Examples:
• A peer invites the target student to be a part of his or her group by saying “come over and join us John.”
• A peer greets the target student upon entering the room by saying “hi John, how are you today.
• A peer asked the student a question, for example, “what did you think of that video we watched in class.”

Non-examples:
• Peers are talking to each other about last nights sporting event and the target student is oriented towards them by not involved in the conversation.
• A peer asks the teacher for something on the target student’s behalf.
• A peer comments is sitting by the target student, looking at their phone and comments to themselves about a text message they just got.

Engagement: Engagement will be recorded if the student is engaged in or attending to class activities and expectations appropriately. Engagement is defined by on-task behaviors such as orienting toward the teacher when they are speaking, orienting towards work when something has been assigned, or orienting toward and actively participating in a group during cooperative activities. Generally we are looking to see if the target student is engaging in the same type of behaviors that his or her classmates are, given that these activities may be modified and appropriate accommodations may be provided. Engagement is the only variable that includes a set of behaviors that have to be present through the majority of the interval (i.e., 9 out of 10 seconds). This is different than interactions that need to only occur once.

Examples:
• When directed to work in a small group, the target student is sitting with the same group, listening, and contributing periodically.
• When the teacher is giving directions to the whole class on how to complete an activity, the target student is looking at the teacher.
• When giving an individual assignment, the target student is looking at their paper,
writing on their paper, and occasionally asks a peer for assistance.

- When doing individual work, the target student raises their hand to recruit the teacher’s attention and assistance and waits quietly for the teacher to come over.

**Non-examples:**

- The target student is engaging in self-stimulating stereotypic behavior
- When the teacher is given directions, the target student has their head down on the desk.
- During a group activity, the target student is sitting alone playing doodling on the paper.

**Instructional Format:** For each interval, we will record what the instructional expectations of the classroom during that interval were. This variable has 5 possible options. It is possible that the expectations may change during the interval (e.g., students are working independently for the first 7 seconds and the teacher begins to give new directions in the last 3 seconds. You must circle the one that best applies, as in applies to the majority of the time from that interval. The options for instructional formats are as follows:

- **Independent Work (IW):** The teacher has directed the whole class to complete a specific assignment or set of assignments individually. The may also be a classroom routine, for example when students enter the room they independent work on the problems written on the board. For a target student with a severe disability, this may look like the student doing a adapted version of what the class is engaging in, or the student may be paired with a paraeducator or peer to provide accommodations (e.g., scribing answers, reading text).

- **Group Activity (GA):** The teacher has directed whole class to complete a group activity or work in pairs on a collaborative activity.

- **Class Discussion (CD):** The whole class is involved in an open discussion where the teacher is asking questions and the students are taking turns contributing on a central subject.

- **Teacher-Directed (TD):** The teacher is giving the students directions, lecturing on content, or talking to the whole class and the students are expected to be quite and attentive.

**Unstructured Time (UT):** A specific direction has not been given and a routine activity is not taking place. There are not specific expectations on the students related to class work.
Appendix C: Data Collection Form
<table>
<thead>
<tr>
<th>Interval</th>
<th>Target Student Reponse</th>
<th>Peer Behavior</th>
<th>Instructional Format</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interactions of target student towards peer</td>
<td>Interactions of target student towards non-peer</td>
<td>Interactions of non-target student towards student</td>
<td>Interactions of non-target student towards non-peer</td>
</tr>
<tr>
<td>1</td>
<td>RA QA CO TD UT</td>
<td></td>
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<tr>
<td>2</td>
<td>RA QA CO TD UT</td>
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<tr>
<td>3</td>
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<td>RA QA CO TD UT</td>
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<tr>
<td>14</td>
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<tr>
<td>16</td>
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<tr>
<td>17</td>
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<td>18</td>
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<td>20</td>
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<td>22</td>
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<td>23</td>
<td>RA QA CO TD UT</td>
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<td></td>
<td></td>
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<tr>
<td>24</td>
<td>RA QA CO TD UT</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Appendix D: Procedural Fidelity Checklist
Fidelity Checklist for the Initial Peer Support Arrangement Meeting

Interventionist: ________________________

Target student: ________________________

Peers: ____________________________________________

+ = Implemented independently

X = Implemented after prompting

☐ Made introductions

☐ Provided peers a rationale for peers supports

☐ Provided background about the student with a disability

☐ Presented general goals in this class

☐ Explained confidentiality and respectful language

☐ Discussed expectations specific to the classroom

☐ Introduced peer support strategies

☐ Introduced self-monitoring system

☐ Discussed when to Seek Assistance

☐ Led discussion and answered questions

☐ Discussed next steps
Appendix E: Example Peer Support Plan
Example Peer Support Plan

The Biology class is a great place for Brad to work on goals related to developing social and conversational skills, as well as expanding his typing and writing skills. Below are some ideas for how Brad might become more involved in class activities during Biology, as well as some ideas for how the peers at Brad’s table could support him.

At the beginning of class...

<table>
<thead>
<tr>
<th>Brad could...</th>
<th>Peers could...</th>
<th>The facilitator could...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talk quietly with his peers (when it is okay with the teacher)</td>
<td>Ask Brad about his day or upcoming school events</td>
<td>Try to draw some of the peers at the table into conversation with Brad—you may have to do some modeling or give them some ideas of things they could ask about or prompt Brad to ask questions of his peers</td>
</tr>
<tr>
<td>Pass out worksheets or other materials to the class (if there are any that day)</td>
<td>Help Brad pass out any worksheets</td>
<td>Make sure Brad has the same materials as his classmates, such as a book, worksheets, lab materials, etc.</td>
</tr>
<tr>
<td>Listen and respond to Ms. Hale as she does attendance</td>
<td>Make sure Brad has all of the same materials for class, such as a book, worksheets, lab materials, etc.</td>
<td>Look through the materials quickly to see if there are any things that could be adapted readily</td>
</tr>
<tr>
<td>Boot up his laptop, if he will be taking notes in class</td>
<td>Help Brad get out his notebook, pen, paper, etc. for class</td>
<td></td>
</tr>
</tbody>
</table>

When there are lectures or whole group instruction...

<table>
<thead>
<tr>
<th>Brad could...</th>
<th>Peers could...</th>
<th>The facilitator could...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listen to Ms. Hale as the present information to the class</td>
<td>Make sure Brad has all of the same materials for the activity as they do</td>
<td>Make sure Brad has the same materials as his classmates</td>
</tr>
<tr>
<td>Quietly ask his peers questions about the material Ms. Hale is presenting</td>
<td>As you are taking your own notes, copy down on a separate piece of paper some of the important words or ideas from the class discussion; Brad can then type these as his own notes or copy them down with the facilitator’s help. Write fairly large so Brad can see clearly.</td>
<td>Always brainstorm ways Brad can be engaged in the discussion. Can he answer a question? Can he share an idea?</td>
</tr>
<tr>
<td>Take notes by typing important specific key words or phrases that are being written down by a peer (preferably) or the facilitator</td>
<td>Periodically check to make sure Brad is doing okay with typing or writing his notes</td>
<td>Help Brad to take modified notes by typing key words/ phrases on the laptop (preferred) or writing them out by hand</td>
</tr>
<tr>
<td>Copy by hand those same key words or phrases with the facilitator’s help or highlight notes</td>
<td>Occasionally lean over and quietly summarize a key point or interesting fact for Brad, or ask him simple questions that help him follow along</td>
<td>Encourage Brad to look at Ms. Hale or the whiteboard as instruction is taking place</td>
</tr>
<tr>
<td>Turn off/on the lights when Ms. Hale is using the overhead projector</td>
<td>Encourage Brad with lots of positive feedback such as “Wow, you take really good notes!”</td>
<td>Let the peers know when they are doing a great job interacting with or supporting Brad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prompt Brad to ask his peers to double-check his notes</td>
</tr>
</tbody>
</table>
1When there are small group or lab activities...

<table>
<thead>
<tr>
<th>Brad could...</th>
<th>Peers could...</th>
<th>The facilitator could...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Listen to Ms. Hale as she presents instructions to the class</td>
<td>• Make sure Brad has all of the same materials as his classmates for the activity</td>
<td>• Make sure Brad has the same materials as his classmates for the activity</td>
</tr>
<tr>
<td>• Participate in the small group or lab activity</td>
<td>• Give Brad opportunities to make choices about or give input into the activity.</td>
<td>• Always brainstorm ways Brad can be engaged—even in small ways—in the activity. Can he mark the group’s answers on the worksheet? Can he be asked his opinion about an answer?</td>
</tr>
<tr>
<td>• Ask peers for help during his part of the activity</td>
<td>• Even if Brad can’t do all of an activity, he can probably still do a part of it.</td>
<td>• Give peers ideas for questions they can ask Brad or ways they can involve him—think creatively!</td>
</tr>
<tr>
<td></td>
<td>• Encourage Brad with lots of positive feedback such as “That was a great answer!”</td>
<td>• Let the peers know when they are doing a great job supporting Brad</td>
</tr>
</tbody>
</table>

When there is independent seatwork...

<table>
<thead>
<tr>
<th>Brad could...</th>
<th>Peers could...</th>
<th>The facilitator could...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Listen to Ms. Hale as she presents instructions to the class</td>
<td>• Before beginning your own work, make sure Brad has all of the materials he needs for the activity</td>
<td>• Make sure Brad has the same materials as his classmates for the activity</td>
</tr>
<tr>
<td>• Work with the facilitator to finish the worksheet or other activity</td>
<td>• When you are finished with your own work, check in to see if Brad could use some help finishing his own work or help double check his answers</td>
<td>• Work with Brad on completing the activity in a modified way. Can Brad tell you the answer if you read it to him? If you gave him the answer, could he practice typing or writing it down on the worksheet?</td>
</tr>
<tr>
<td>• When other peers are done, ask them for help completing his work</td>
<td>• Encourage Brad with lots of positive feedback such as “Awesome, you got the answer to number ten!”</td>
<td>• Is there an alternative activity Brad could complete?</td>
</tr>
</tbody>
</table>

At the end of class...

<table>
<thead>
<tr>
<th>Brad could...</th>
<th>Peers could...</th>
<th>The facilitator could...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Talk quietly with his peers (if everyone’s work is completed)</td>
<td>• Ask Brad about his day, what he is doing after school, or upcoming events</td>
<td>• Make sure Brad has the same materials as classmates</td>
</tr>
<tr>
<td>• Collect any materials for Ms. Hale</td>
<td>• Help Brad put away his things</td>
<td>• Try to draw all peers at the table into conversation with Brad—you may have to do a little modeling to get things started</td>
</tr>
<tr>
<td>• Put away his things</td>
<td>• Walk with Brad to or past way to his next class</td>
<td></td>
</tr>
<tr>
<td>• Shut down his computer if he was taking notes in class</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix F: Social Validity Measures
Exit interview for peers

Did you enjoy helping [the target student]?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

Was it easy to help [the target student]?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

Do you learn things from helping [the target student]?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

If asked, would you volunteer to do this again?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

If your friend asked, would you tell them to volunteer for this?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

How would you describe fill in the name of the student with a severe disability?

How do you interact with fill in the name of the student with a severe disability?

When you see fill in the name of the student with a severe disability in fill in the name of the generalization setting how do you interact?

Did you enjoy spending more time with fill in the name of the student with a severe disability?
   a) If yes, what did you enjoy about it?
   b) If no, what did you not like about it?
Exit interview for student with IDD
Who are your friends in this classroom?

Have you met any new friends in this class recently?

Did you enjoy spending more time with fill in the name of the peer(s)?
   a) If yes, what did you enjoy about it?
   b) If no, what did you not like about it?

Did fill in the name of the peer(s) help you participate more in class?
Exit interview for general education teachers, paraprofessionals, and the special education teacher

Was this strategy effective in increasing interactions between [the target student] and their peers?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

Was this strategy helpful to you as a teacher or paraprofessional?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

Was this strategy easy to implement?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

If you had a student with similar needs in the future, would you consider using this strategy again?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

If another teacher had a student with similar needs, would you recommend this strategy?
1 = not at all  2 = not really  3 = neutral  4 = somewhat  5 = very much

Has fill in the name of the student with a severe disability interactions with his/her peers in your classroom changed at all since we started this study?
    a) If so, describe the changes you have noticed.

Has the way fill in the name of the student with a severe disability typically interacts with material you have planned changed at all since we started this study?
    a) If so, describe the changes you have noticed.
Have the challenges of supporting fill in the name of the student with a severe disability in your classroom changed at all since we started this study?
   a) If so, describe the changes you have noticed.

Have the supports fill in the name of the student with a severe disability needs from you or other adults in the room changed at all since we started this study?
   a) If so, describe the changes you have noticed.

Has the way that fill in the name of the peer(s) interact in the class changed at all since we started the study?
   a) If so, describe the changes you have noticed.
Exit interview for special education teachers
1) Has the way [target student] interactions with his/her peers in the general education classroom changed at all since we started this study?
   a) If so, describe the changes you have noticed.

2) Has the way [target student] interactions with his/her peers in the cafeteria or recess yard changed at all since we started this study?
   a) If so, describe the changes you have noticed.

3) Has the way [target student] typically interacts with activities in the general education classroom changed at all since we started this study?
   a) If so, describe the changes you have noticed.

4) Have the challenges of supporting [target student] in inclusive settings changed at all since we started this study?
   a) If so, describe the changes you have noticed.

5) Have the supports [target student] needs from you or other adults in inclusive settings changed at all since we started this study?
   a) If so, describe the changes you have noticed.