A Portrait of Peers Within Peer-Mediated Interventions: A Literature Review

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Abstract
Although the impact of peer-mediated interventions on students with intellectual and developmental disabilities (IDD) has been studied extensively, little attention has focused on the peers without disabilities who are so central to these interventions. We reviewed 98 studies to examine the portrait of more than 3,000 peers without disabilities who have participated in peer-mediated interventions involving middle and high school students with IDD. Peer and student demographics were very diverse, as were the methods for peer recruitment and selection, the interventions they delivered, the settings in which they spent time with students with IDD, and the ways in which they were prepared for these roles. However, reporting in these areas was limited across studies. We offer recommendations for strengthening research and practice focused on the contributions of peers within these evidence-based interventions.

Keywords
peers, peer-mediated intervention, inclusion, intellectual disability, autism

Middle and high school can be a time of substantial learning and growth for adolescents with intellectual and developmental disabilities (IDD). The broad array of courses, extracurricular activities, school-sponsored events, and social opportunities available during middle and high school offer a rich context for learning and relationships. Unfortunately, access to these myriad experiences—within and beyond the classroom—remains uneven for many secondary students with IDD (Agran et al., 2020; Dymond et al., 2020). Educators need effective strategies and supports to ensure students with IDD benefit from the important instructional and interpersonal experiences available throughout their schools.

Peers provide an especially promising pathway for supporting access to the abundance of experiences offered during secondary school. Indeed, peer-mediated interventions (PMIs) comprise an evidence-based approach for addressing the academic and social needs of adolescents with IDD (Kuntz & Carter, 2019; Steinbrenner et al., 2020). Scores of studies demonstrate the varied ways in which peers without disabilities can provide support, assistance, or instruction to their schoolmates with IDD. For example, peers have been involved in promoting general education participation (peer support arrangements, one to three peers per student with a disability; Brock & Huber, 2017), providing instruction on academic content (peer tutoring, one to two peers per student with a disability; Hudson et al., 2013), fostering social connections outside of the classroom (peer networks, three to six peers per student with a disability; Carter, 2021), promoting communicative competence (communication device interventions, one or more peers per student with a disability; Biggs et al., 2019), and expanding social opportunities at their school (peer partner programs, multiple peers per student with a disability; Hughes et al., 2012).

Peer-mediated approaches have long been used to promote the academic and social outcomes of students with IDD (Odom, 2019). Moreover, the involvement of peers in the education of students with IDD is still advocated for a variety of reasons. First, it is common practice for students without disabilities to learn alongside and from their classmates and schoolmates. In contrast, students with IDD often miss out on this normative experience when supported exclusively by one-to-one paraprofessionals (Giangreco, 2010). Second, connecting students with and without disabilities through PMI creates regular opportunities for students to meet and get to know one another. These shared activities over time can provide a foundation for future friendship formation (Biggs & Carter, 2017). Third, peers can be effective in modeling appropriate academic and social behaviors. Their own involvement in the curriculum and knowledge of adolescent culture can give them insights and creativity on what skills to teach and how. Fourth, the wide availability of peers makes them a natural and

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ubiquitous source of support. Finally, peers can themselves benefit personally from their involvement in peer-mediated interventions (Travers & Carter, 2021).

Yet, surprisingly little attention has focused on the peers who have participated in these evidence-based interventions. Although their contributions to the delivery and success of PMIs within the literature are clear, the overall portrait of these peers is not. Which peers have participated in these studies and how were they invited? How and where have they been involved in supporting students with IDD? In what ways have they been prepared for these roles? Such information could provide helpful guidance to the numerous educators across the country who adopt PMIs within their classrooms and schools. To date, only one review has examined the characteristics of the peers involved in the spectrum of PMIs. Schaefer et al. (2016) reviewed 53 PMI studies conducted in K–12 schools for students with an intellectual disability. Although their review focused primarily on the social and academic outcomes of peers without disabilities, they also reported demographic information for these participating peers. Among those peers for whom information was provided, most were female (64%) and in either middle or high school (58%). Many were either nominated for involvement by a teacher (43%) or they had an existing relationship with the student with intellectual disability (52%).

The purpose of our systematic literature review is to summarize what is known about the peers who have been involved in PMIs alongside secondary students with IDD. We substantially expand upon the work of Schaefer et al. (2016) by including studies focused on students with intellectual disability and/or autism, incorporating both unpublished (i.e., dissertations, theses) and nonexperimental (e.g., qualitative) studies, broadening our inclusion criteria (i.e., not limiting studies to those that measured a peer behavior separate from the behavior of the student[s] with disabilities), and expanding the range of variables we examine (e.g., peer demographics, peer selection). In contrast to the Schaefer et al. review, our focus is fixed on peers enrolled in secondary school (i.e., sixth through 12th grade). Secondary settings are considerably different in structure, expectations, curriculum, and culture than preschool and elementary school. Moreover, the way students develop friendships, socialize, and spend time together in school changes substantially during the adolescent years. As a result, the portrait of peers—as well as the ways and contexts in which peers support students with IDD—would look different in the upper grades. We addressed the following research questions:

Research Question 1 (RQ1): Which peers have participated in these interventions?
Research Question 2 (RQ2): What recruitment approaches and selection criteria were used to identify peers?

Research Question 3 (RQ3): Who are the students with disabilities these peers supported?
Research Question 4 (RQ4): In what types of interventions have peers participated?
Research Question 5 (RQ5): In which settings have these interventions been implemented?
Research Question 6 (RQ6): How were peers trained to carry out their roles?

Method

Inclusion Criteria

We used four inclusion criteria to select relevant studies. First, studies were published in English prior to May 2020. We set no early limit on the year of publication. Second, the study addressed the delivery of a PMI within a secondary school. A PMI refers to a formal and sustained experience among students with and without disabilities whereby peers are taught or directed by an adult to implement instructional programs, behavioral interventions, and/or facilitate social interaction (Chan et al., 2009). Studies could involve experimental examinations of a PMI (e.g., Asmus et al., 2017; Biggs et al., 2017) using randomized control trial or single-case research design methodology. Likewise, they could involve nonexperimental examinations of a PMI (e.g., Hughes et al., 2001; Hunsaker, 2014) using qualitative, survey, or correlational methodology. Finally, studies could employ a mixed-methods design using a combination of methodologies (e.g., Skipper, 2011; Stroman, 2019). Third, the PMI focused primarily on students with IDD (i.e., students served under the special education categories of intellectual disability, autism, or multiple disabilities) as indicated by special education category, IQ score, other reported testing (e.g., ADOS score), or related labels (e.g., "severe disabilities," "profound disabilities"). For studies with mixed samples, more than 50% of individuals must have had an IDD or results must have been disaggregated. Fourth, participating peers must not have had an IDD and were enrolled in middle or high school (i.e., Grades 6–12).

Search Procedures

We conducted a comprehensive search using the entire electronic ProQuest database, inclusive of Dissertations & Theses, ERIC, and PsycInfo. We used a combination of terms for PMIs that incorporated the names of common approaches (i.e., "peer assist*" OR "peer buddy" OR "peer direct*" OR "peer initiation" OR "peer mediat*" OR "peer-mediated" OR "peer network" OR "peer partner" OR "peer support arrangement*" OR "peer teaching" OR "peer training" OR "social network*" OR "special friends"), the disability categories of interest ("alternate assessment" OR

"Asperger" OR "autis*" OR "cognitive disabilit*" OR "cognitive impair*" OR "cognitively impaired" OR "complex communication needs" OR "developmental disabilit*" OR "intellectual disabilit*" OR intellectual retardation" OR "mental retardation" OR "mild retardation" OR "multiple disabilit*" OR "profound disabilit*" OR "severe disabilit*" OR "significant disabilit*" OR "students with moderate and severe disabilities" OR "traumatic brain injury"), and the age level of interest ("adolescent" OR "high school*" OR "intermediate school" OR "junior high" OR "middle school*" OR "secondary school" OR "secondary students" OR "teenage*" OR "transition age*"). This search was inclusive of peer-reviewed journal articles, dissertations, and theses. We also conducted a manual search of all articles published in *Inclusion*, as this journal was not indexed. Finally, we reviewed all article references (i.e., backward search) and used Google Scholar to locate and review all studies citing each of the articles (i.e., forward search).

The initial search was conducted in October 2018 and yielded 808 unique records. Following the initial search, the first author screened all titles and abstracts, retaining articles that could not easily be excluded based on the inclusion criteria. This yielded 118 potentially relevant articles. Backward and forward searches yielded an additional 30 studies. A final review of the entire contents of each study resulted in 88 studies that met all four inclusion criteria. To assess interrater reliability on the screening of articles, the second author independently screened 20% of the initial search results ($n = 162$) to determine whether each met the inclusion criteria. We calculated agreement by dividing the number of agreements by the number of agreements plus the number of disagreements and multiplied by 100%. Reliability was 97.0%.

We updated the search in May 2020 using the same search terms, criteria, and processes. This search yielded an additional 132 unique records. The first author screened all new titles and abstracts and again retained articles that could not be easily excluded based on the four inclusion criteria. This yielded 20 potentially relevant articles. The second author independently screened 20% of the initial search results ($n = 27$); reliability was 96.3%. Only 10 of these studies met our inclusion criteria, resulting in a total of 98 articles included in this review.

Coding Procedures

We extracted descriptive information from all studies in six areas—each aligned to a research question. When information was not reported, we coded it as unknown or unspecified.

Participating peers. We coded the total number of peers involved in the PMI, as well as their *age, grade, sex*, and *race/ethnicity*. We categorized whether peers were reported to have had any *prior experience with individuals with disabilities*, whether generally (e.g., having a relative with disabilities, having a classmate) or with the specific student(s) involved in the PMI.

Peer recruitment and selection. We coded whether the study reported *how the peers were recruited* and the approaches that were used (i.e., by teachers/paraprofessionals directly, by a member of the research team directly, through a class or club announcement, through seeing a flyer, other). We also coded whether the study indicated the *criteria for peer selection* and the nature of those criteria (i.e., academic standing, sociability, same class/lunch period, input from student with disabilities, already in a peer program, a teacher thought the peer would benefit from involvement, common interests, history of prior positive interactions, strong attendance record, other).

Students with disabilities. We coded the *total number* of students with disabilities who met inclusion criteria, as well as their *age, grade, sex*, and *race/ethnicity*. We coded their *disability category* as ASD only, ID only, ASD and ID, or other not specified (e.g., multiple disabilities, developmental delay, severe disabilities). We coded each participant's *communication mode* as verbal, pictures (e.g., PECS), augmentative communication device, signs, or gestures and/or vocalizations. A participant could have more than one communication mode (e.g., gestures and pictures). Finally, we coded *indication of problem behavior* as whether and how the authors described a student's problem behavior.

Intervention approaches. We categorized each PMI into its *primary approach*: peer support arrangement, peer network, peer tutoring, peer partner program, social skills intervention, PMI targeting student maladaptive behavior, communication device intervention, and cooperative learning groups. We coded the *length of each meeting between students* (i.e., sessions) as less than 10 min, 10 to 29 min, 30 to 59 min, 60 to 90 min, or more than 90 min. We coded *intervention length* based on the shortest intervention condition. This reflected the minimum amount of time any peer participated in the PMI, as there was often variability across peers within studies using single-case methodology. For multiple baseline or multiple probe designs, we coded the shortest intervention condition across all participants or behaviors. For withdrawal designs, we coded the shortest total time in intervention across participants. For alternating treatment design or adapted alternating treatment designs, we coded the shortest intervention condition across all participants.

Intervention settings. We coded the *school settings* (i.e., core academic, related arts, gym, special education classroom, cafeteria, other, unknown/unclear) and the *school level* (i.e.,

elementary school, middle/junior high school, high school) for the PMI. We also coded the district's *geographic location* and *community type* (i.e., urban, suburban, rural, and unknown/unclear).

Peer training. To differentiate initial training from ongoing coaching, we defined peer training as any information provided to peers *before* their involvement in the PMI. We coded *who provided the training to peers* (i.e., researcher, general education teacher, special education teacher, paraprofessional, other), *number of training sessions* (i.e., 1, 2, varied by participant, other), *total training length* (i.e., 10 min or less, 11–20 min, 21–30 min, 31–40 min, 41–50 min, 50 or more min, varied by participant), and *training approach* based on whether it included any of the following components derived from Kuntz and Carter (2019): (a) a verbal or written explanation of the purpose or rationale of the intervention; (b) a verbal description of instructions related to defining the practice and its implementation, including providing a summary, review, explanation, discussion, or similar not otherwise specified as being part of written material; (c) someone modeling the procedure for the peer; (d) a written description of instruction (i.e., written material that describes how to implement the strategy/intervention) such as a training manual; (e) opportunities for the peer to perform or rehearse the skill; (f) opportunities for the peer to ask questions about the procedures; (g) talking about disabilities or background information about the specific student(s) with disabilities in the PMI; (h) instructions for the peer to collect and review data; (i) the peer setting a performance goal related to their implementation of the practice; and (j) other. In addition to coding training provided to peers before the intervention, we also coded whether the peer received any *ongoing coaching or feedback* (verbal or written).

Interrater Reliability

To determine the interrater reliability on the coding of the articles, two trained coders—graduate students in special education—independently coded a total of 21 randomly selected studies (21.4%). Interrater reliability averaged 90.0% (range = 82.5%–98.2%). Following the coding of each article, discrepancies were discussed until consensus was reached.

Findings

We identified 98 studies examining PMIs at the secondary level. Detailed summaries of each study are included in online Appendix A. These studies were published across a span of 38 years (1981–2019) within 28 different journals. Seventy-seven (78.6%) studies were experimental (i.e., employed a randomized control trial or single-case research methodology), 18 (18.4%) were nonexperimental (e.g., employed a qualitative, survey, or correlational methodology), and three studies (3.1%) employed mixed-methods designs.

Which Peers Have Participated in These Interventions?

Table 1 displays aggregated peer information for 91 of the 98 included studies that reported at least some demographic characteristics. Across these studies, 3,413 peers met the inclusion criteria. Almost half of peers were female (49.0%) and less than half (42.1%) were male; the remainder was not reported. Race/ethnicity, age, and grade levels are also displayed in Table 1. However, race/ethnicity information was not reported for one fifth of peers, grade was not reported for one fourth of peers, and age was almost never reported. Likewise, little information was provided about the prior experience peers had with individuals with disabilities. Specifically, 2.6% of peers were reported to have had experience with students with disabilities involved in the PMI and 3.9% of peers were reported to have had prior experience with other individuals with disabilities (e.g., family member, through a previous PMI, sports team).

What Recruitment Approaches and Selection Criteria Were Used to Identify Peers?

Sixty-four studies (65.3%) reported how the peers were recruited. Specifically, 40 studies indicated that peers were recruited through teachers or paraprofessionals, peers in 13 studies volunteered to participate after hearing about the PMI through a class or club announcement, a member of the research team recruited students in five studies, peers volunteered for the PMI after seeing a school flyer in three studies, and 16 studies used other methods (e.g., recruitment by a guidance counselor, recruited by an unspecified network facilitator, recruited by peers who had already returned consent forms, convenience sample).

Eighty studies (81.6%) reported one or more criteria by which peers were selected to participate. Thirty-eight studies selected peers who already shared a class or a lunch period with the students with disabilities; 19 studies required peers to already be in a peer program or class supporting students with disabilities (e.g., peer buddy program, peer mentor class, peer tutor program); 17 studies required peers to have a history of regular attendance; 17 studies required that peers be sociable or demonstrate appropriate social interaction skills; 14 studies required peers to have a particular academic standing or demonstrate high levels of academic engagement; seven studies required that the students with disabilities provide input and help select the peers; seven studies required the peer to have a history of positive

Table 1. Demographic Information for Peers and Students With Disabilities.

Variable	Peers *n* (%)	Students with disabilities *n* (%)
Total number of students	3,414	985
Age (years)		
11–12	41 (1.2%)	55 (5.6%)
13–14	41 (1.2%)	66 (6.7%)
15–16	25 (0.7%)	98 (9.9%)
17–18	69 (2.0%)	80 (8.1%)
19+	1 (0.0%)	14 (1.4%)
Not reported	3,237 (94.8%)	672 (68.2%)
Grade		
6	39 (1.1%)	28 (2.8)
7	134 (3.9%)	50 (5.1%)
8	45 (1.3%)	21 (2.1%)
9	635 (18.6%)	50 (5.1%)
10	552 (16.2%)	124 (12.6%)
11	579 (17.0%)	54 (5.5%)
12	568 (16.6%)	48 (4.9%)
Not reported	862 (25.3%)	610 (61.9%)
Sex		
Female	1,675 (49.1%)	315 (32.0%)
Male	1,437 (42.1%)	658 (66.8%)
Not reported	302 (8.8%)	12 (1.2%)
Race/ethnicity		
African American	423 (12.4%)	244 (24.8%)
Asian	32 (0.9%)	16 (1.6%)
Multiracial	16 (0.5%)	14 (1.4%)
Hispanic/Latinx	513 (15.0%)	46 (4.7%)
Native American	3 (0.1%)	4 (0.4%)
White/non-Hispanic	1,785 (52.3%)	448 (45.5%)
Other	215 (6.3%)	11 (1.1%)
Not reported	740 (21.7%)	202 (20.5%)
Disability		
ASD	—	247 (25.1%)
ID	—	219 (22.2%)
ASD and ID	—	53 (5.4%)
Other	—	466 (47.3%)
Evidence of challenging behaviors	—	36 (3.7%)
Communication modes[a]		
Verbal	—	256 (26.0%)
Picture	—	10 (1.0%)
Device	—	7 (0.7%)
Sign	—	12 (1.2%)
Gesture	—	34 (3.5%)
Not reported	—	698 (70.9%)

Note. ASD = autism spectrum disorder; ID = intellectual disability.
[a]More than one communication mode could have been reported per student.

interactions with the particular students with disabilities included in the PMI; seven studies involved peers who were nominated by a teacher as someone who would benefit from the PMI experience; four studies required that peers share common interests with the students with disabilities; and 45 studies listed additional other criteria (e.g., worked well with adults, seemed willing to help other students in class, of the same sex as the student with disabilities, expressed interest in interacting with the student with disabilities, compassion for peers).
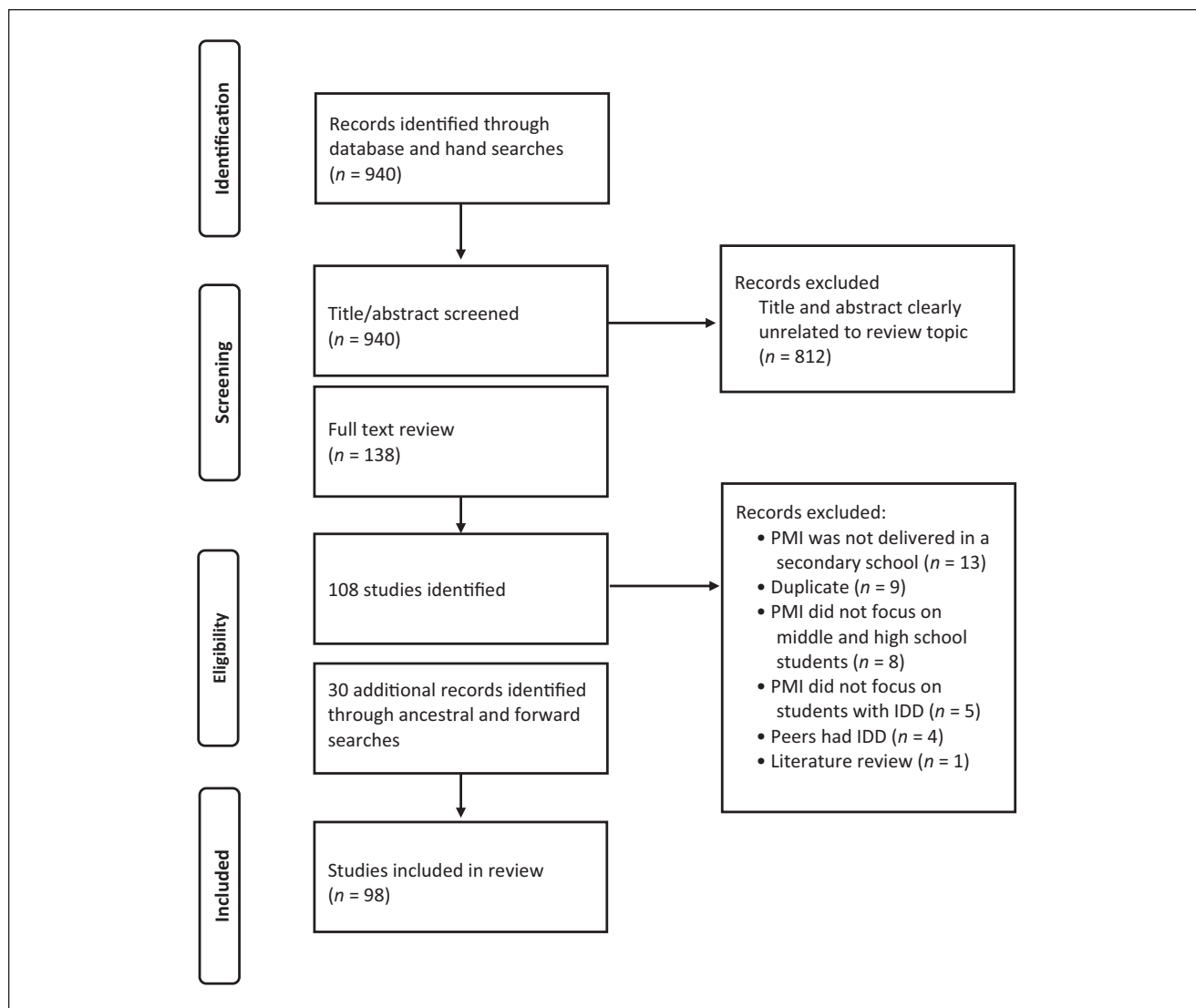
Figure 1. PRISMA diagram (Moher, et al., 2009).

Who Are the Students With Disabilities These Peers Supported?

Ninety-two studies (94%) reported on the demographic characteristics of the students with IDD involved in these interventions. Within these studies, 985 students with disabilities met inclusion criteria. See Table 1 for information on gender, race/ethnicity, age, and grade level. Age and grade level were only reported for 31.8% and 38.1% of the students, respectively. However, the majority of students with reported ages were between 15 and 18 years old (56.9%) and attended high school (i.e., ninth through 12th grade; 73.6%). Eight studies did not report the specific disabilities of the students involved, but instead reported the students had "severe disabilities," "multiple disabilities," or "other developmental disabilities" (e.g., Asmus et al., 2017;

Hughes et al., 2001). Participants in these eight studies accounted for almost half (47.3%) of all students with disabilities included in this review. The remaining students had intellectual disability (22.2%), autism (25.1%), or both intellectual disability and autism (5.4%). Communication mode was only reported for 29.1% of the students involved in these studies. Among these students, 80.3% used verbal communication. Only 3.7% of students with disabilities were described as having challenging behaviors.

In What Types of Interventions Have Peers Participated?

Peers participated in a wide variety of intervention approaches (see online Appendix A). Specifically, 26 studies involved peer support arrangements, 21 involved peer

tutoring, 18 involved peer networks, 16 involved social skills interventions, six involved peer partner programs, six involved communication device/communication book interventions, five involved PMIs targeting behavior (i.e., maladaptive behavior or off-task behavior), and four involved cooperative learning groups. Three studies involved both peer networks and peer support arrangements (Asmus et al., 2016; Carter et al., 2019; Leigers et al., 2017); one study involved a peer tutoring and a peer partner intervention (Haring et al., 1987).

Most interventions were fairly short in duration: 10 studies lasted less than 1 week, 49 lasted between one school week and 1 month, 25 studies lasted between 1 and 4 months (up to a school semester), and seven lasted more than 4 months. Seven studies did not report the length of time it took to carry out the intervention and this information could not be deduced from graphed data. The majority of studies (*n* = 41) employed interventions that took on average 30 to 59 min to implement per session. Only four studies took less than 10 min to implement per session, 16 studies took between 10 and 29 min per session, seven studies took between 60 and 90 min per session, and two studies took more than 90 min per session. The length of each intervention session was not reported in 34 studies.

In Which Settings Have These Interventions Been Implemented?

Peers and students with disabilities participated in PMIs across a variety of school settings; some studies occurred in multiple settings (see online Appendix A). About one third (29.6%) of PMIs were delivered fully or in part in an academic course (e.g., English, math, science, social studies). Other contexts included the school cafeteria during lunchtime (23.5%), a related arts or elective class period (e.g., foreign language, art, computer, health; 21.4%), a special education classroom (20.4%), a physical education class (12.2%), an empty classroom or office (11.2%), or other unique settings (e.g., during transition periods in the hallway, various sites around school, homeroom, library; 25.5%). Eleven studies (11.2%) did not clearly report the context.

In terms of school level, 61 studies took place in high schools, 36 took place in middle schools, one study took place in a sixth-grade classroom in a primary school (i.e., Bensted, 2000), and two studies (i.e., Carter et al., 2005; Leigers et al., 2017) took place at both middle and high schools. Three studies did not report the type of school (i.e., elementary, middle, high; Odluyurt et al., 2014; Regelski, 2016; Tekin-Iftar, 2003); however, specific student grade levels were reported for either the peer or the students with disabilities. In terms of community type, 34 studies took place in urban school districts, 23 in suburban school districts, and 17 in rural school districts; 36 studies did not report this information.

Geographic location was reported in 60 studies (61.2%). Six studies were conducted outside of the United States. Of the remaining 54 studies, 17 studies were conducted in the Southeast, 14 in the Midwest, 12 in the West, seven in the Northeast, three in the South, three in the Northwest, and one in the Southwest. Three studies were multistate studies.

How Were Peers Trained to Carry Out Their Roles?

A range of personnel were involved in training participating peers, with several studies involving multiple trainers. The most common trainers were researchers (42.9%), followed by special education teachers (20.4%), paraprofessionals (12.2%), general education teachers (11.2%), and other school personnel (e.g., speech language pathologist, school counselor, job coach, social worker; 12.2%). The person providing the training was not reported in 23.5% of studies. Almost half (48.0%) of the studies provided just one or two training sessions before beginning the intervention. Other studies included more than two training sessions (28.6%) or did not report the number of training sessions (23.5%).

Just over half (54.1%) of studies reported how long this initial peer training lasted, although training length varied widely. The majority of studies took at least 50 min total to provide initial training to peers (*n* = 33 studies). Remaining studies took less time; initial training for four studies ranged from 11 to 20 min, initial training for six studies ranged from 21 to 30 min, initial training for four studies lasted between 31 and 40 min, and initial training for six studies lasted between 41 and 50 min. Two studies (i.e., Asmus et al., 2016; Carter et al., 2017) employed multiple intervention approaches that required different types of peer training with different initial training times. Data related to initial training times for each of the unique PMIs within a study were collected.

Many studies (*n* = 26) did not provide detailed or clear information about the approaches used to train the peers. When this information was provided, the ways in which peers were trained varied widely and often included multiple components. The most common method of training used across studies involved a verbal description of the PMI provided to the peers (61.2%). Other approaches to training included an adult modeling the intervention procedures for the peer (44.9%), time for the peers to practice or rehearse the PMI procedures (42.9%), an explanation or rationale provided to the peers (31.6%), a training component whereby the trainer talked to the peers about disabilities or provided background information about the specific students with disabilities involved in the study (29.6%), an opportunity for the peers to ask questions (26.5%), a written description of the PMI or a training manual (24.5%), instructions for the peers to collect and review data (13.3%),

and information related to the peer setting a performance goal related to the implementation of their practice (11.2%). Fourteen studies included additional training components not listed (e.g., peer group discussion, video modeling) or lacked descriptive information (e.g., "peer coaches learned to prompt engagement in activities"; Brain & Mirenda, 2019). In addition to training peers prior to intervention, several studies also incorporated ongoing support or coaching. Specifically, 35 studies (35.7%) included ongoing verbal or written feedback to peers and nine studies (9.2%) included weekly scheduled meetings when peers could discuss or practice implementation of the intervention.

Discussion

Peers have long played an active role in the education and support of students with IDD. Yet, little attention has focused on the peers who contribute in these important and influential ways. This systematic review offers new insights into the involvement of peers within nearly 100 studies addressing PMIs. We highlight key findings from this literature and discuss their implications for future research and intervention delivery in secondary schools.

Participating Peers

The peers who participated in peer-mediated interventions within secondary schools were diverse with regard to their demographics. Although most studies—as well as most of the larger studies—were conducted in high schools among older adolescents, more than one third ($n = 36$) of studies involved younger peers who were enrolled in middle schools. This literature illustrates opportunities across the secondary grade span for peers to participate in these interventions. When sex was reported, the percentage of peers who were female (53.8%) versus male (46.2%) was somewhat balanced. This diverges from more targeted prior reviews addressing specific peer-mediated interventions and/or particular populations of students. For example, Brock and Huber (2017) reported that 67% of peers involved in peer support arrangements for students with severe disabilities were female and Schaefer et al. (2016) reported that twice as many peers in PMIs involving students with intellectual disability were female than male. One area of exception within our review was peer partner programs, in which 5 times as many peers were female than male. Finally, with regard to race/ethnicity, participating peers reflected the diversity of students served in U.S. schools (Hussar et al., 2020). However, some groups of students (e.g., Asian, Hispanic/Latinx) continue to be underrepresented in these studies. Overall, these findings indicate educators have drawn from the wide range of students at their school for involvement in peer-mediated interventions.

Based on these findings, educators should have confidence inviting a wide variety of peers to participate in PMIs at their school. Rather than limiting recruitment to a narrow demographic (e.g., high-achieving girls, student leaders), this collection of studies shows that an array of youth without disabilities can contribute meaningfully within PMIs. Therefore, it may be valuable to partner with general educators, coaches, school counselors, and administrators when designing recruitment activities and determining which peers to involve. Special educators sometimes have a fairly limited sphere of influence within their schools and would benefit from engaging other staff when planning these interventions.

For researchers evaluating PMIs, two issues should be considered. First, more detailed demographic information should be provided about participating peers. For example, age was not reported for 95% of peers, grade level was not reported for 25% of peers, and race/ethnicity was not reported for 22% of peers. Current quality indicators for experimental research emphasize the importance of adequately characterizing the individuals who actively participate within a study—either as recipients or as providers of an intervention (Council for Exceptional Children, 2014; Ledford et al., 2016). Such an omission of information may be because peers are not always considered to be primary study participants or active interventionists. Given their salience to the success of PMIs, we would challenge such a characterization. For example, large age and grade-level differences between peers and the students they support might inadvertently reinforce stigmatizing perceptions of adolescents with disabilities (e.g., Van der Klift & Kunc, 2002). Second, the prior disability experience of participating peers warrants much more attention. Most (80%) studies did not indicate whether peers had prior experience with participating students or other individuals with IDD. When such information was provided, the level of detail varied widely. These prior experiences are likely to influence which peers agree to become involved, their motivations, their capacity to deliver the intervention, and the extent to which they benefit from the experience.

Peer Recruitment and Selection

These studies provide insights into how peers are chosen from among the large number of students attending a particular school. As might be expected, educators had a prominent hand in recruiting peers for these interventions. This primarily involved teachers (general educators and special educators) and paraprofessionals extending invitations, rather than peers responding to general announcements. The criteria used to select these peers, however, varied widely within and across studies. In some cases, they were quite subjective. For example, researchers suggested nominating peers who educators thought would benefit

personally from participating, be motivated to develop a social relationship, or be effective in the peer role. In other cases, more objective criteria were used, such as requiring peers to have good attendance, have certain academic standing, or share a class or lunch period in common with the student with IDD.

For practitioners, these findings should prompt consideration of the approaches used to recruit and select peers. When PMIs have more of an instructional focus for students with IDD, the tutorial skills and academic performance of peers may have more relevance. When PMIs have more of a social focus for students with IDD, the interests, social skills, personal qualities of peers, and student–peer match may be more salient. And when PMIs are intended to also benefit peers (Travers & Carter, 2021), their prior attitudes or experiences may be important to consider. For example, Cushing and Kennedy (1997) selected low-performing peers, anticipating they would benefit academically from supporting their classmates with severe disabilities within peer support arrangements. For researchers, the criteria for selecting peers should be detailed more clearly and a rationale for these decisions should be provided. The ways in which students and peers are selected and paired within PMIs always warrant thoughtful consideration to ensure everyone benefits and no one is devalued.

Students With Disabilities

Peers have played a role in supporting a wide range of schoolmates with disabilities. These peer-mediated interventions focused on adolescents served under a combination of special education categories, including intellectual disability, autism, multiple disabilities, and other secondary disabilities. Moreover, these students with IDD were fairly diverse with regard to their sex, race/ethnicity, and ages. Yet, there may be subgroups of students whom peers work alongside less often. For example, only 4% of participating students with disabilities were reported to exhibit some type of challenging behaviors. This could be because students with severe externalizing behaviors are less likely to participate in inclusive school activities and/or because certain behaviors could put peers at risk of injury. Likewise, only 20% of students with disabilities were described as not using verbal speech. Students who have complex communication needs or use augmentative or alternative communication (AAC) could also benefit substantively from the modeling and support of their peers (Biggs et al., 2019). Educators should consider carefully who in their school would benefit from receiving peer support across the school day. The eight distinct categories of PMI that are summarized in this review paper represent a potential menu of approaches that can be drawn upon to meet the educational and social needs of students with more extensive support needs. Future studies should explore the ways in which PMIs might be adapted to

address the needs of students with more significant behavioral or communication challenges.

Intervention Approaches and Settings

Peers were involved in delivering a constellation of supports associated with a wide range of different intervention approaches. For example, the eight categories of PMI addressed both academic (e.g., peer tutoring, peer support arrangements) and social (e.g., peer networks, social skills interventions) outcomes and were delivered within both instructional (e.g., general and special education classrooms) and noninstructional (e.g., cafeterias, playgrounds) contexts. Most studies were implemented outside of the special education classroom. Taken together, these studies affirm that secondary educators can draw upon peers in a multitude of ways to help address the educational needs of students with IDD—within and beyond the classroom.

Special educators should consider which of these intervention approaches might be applicable in light of the goals of their students and the school settings in which their students spend time. Although some peer-mediated approaches (e.g., peer support arrangements, peer tutoring, peer mentors, social skills interventions) have been studied somewhat extensively at the secondary level, much less research has focused on the delivery of peer partner programs, communication book/device interventions, behavioral interventions, and cooperative learning groups. The ways in which peers are involved in the delivery of each of these interventions should be addressed more fully. Likewise, future studies should focus on additional applications of these interventions within middle school. A much smaller number of studies took place in these settings, where the social and academic milieu may differ from high school.

Peer Training

Equipping peers to provide instruction and/or support is a core component of most PMIs. Although researchers had a prominent role in delivering this initial training, so did other natural school staff (e.g., special educators, paraprofessionals, general educators, related services providers). However, these educators often received direct support from researchers to deliver this training. Additional research is needed to examine how everyday school staff can themselves be equipped to train peers to assume the variety of roles represented in this literature. Several recent studies of peer support arrangements have adopted this focus (e.g., Biggs et al., 2017; Brock & Carter, 2016), but studies with other interventions are needed.

In terms of format, the length of training sessions ranged from as little as 11 min to 1 hr or more. Educators will have to allocate sufficient time early in the semester toward

ensuring peers are both confident and competent in the roles they are being asked to assume within these interventions. Likewise, educators should consider how they design any initial or ongoing training so that it is effective. The training approaches utilized in these studies varied widely in both their level of description and in the ways in which the intervention was conveyed. Some studies involved informal information sharing while others drew upon written manuals; some approaches relied on more passive approaches to information sharing while others incorporated role-playing and modeling. This aspect of PMIs also represents an important avenue for future research. At present, it is unclear what information is most essential to convey to peers and which approaches are most promising for doing so. More work is also needed to parse out which training elements are essential to successful implementation of the interventions by peers so that teachers can identify which PMIs are not only effective but efficient.

Limitations

Our review is descriptive and does not allow conclusions to be drawn about which peers should be selected for these interventions or how peers should be selected. Neither of these characteristics were experimentally contrasted. Moreover, given our inclusion of nonexperimental studies in which efficacy was not gauged, it is not possible to claim that all the studies we reviewed described peer characteristics and selections in the context of effective interventions. Should additional experimental examinations of PMIs implemented at the secondary level accrue, and further, experimental comparisons of PMI characteristics, future reviews can make conclusive recommendations. Finally, there was minimal reporting of information about the students with disabilities whom peers supported (e.g., grade, age, primary educational placements) in the studies we reviewed. For example, little was said about the typical educational placements of students with disabilities, about their input into the selection of peers, or their views on these interventions. The absence of such information makes it more difficult to understand the nature of their relationships with participating peers.

Conclusion

Peers can play a prominent role in supporting the learning, relationships, and full participation of secondary students with IDD. Understanding which peers are invited into these interventions and the roles they play in supporting their schoolmates is important for advancing the adoption of PMIs across the country. The portrait of peers within this review suggests that a wide range of peers can be drawn upon to support a wide range of students in a wide range of ways across a wide range of settings. The versatility of PMIs should be appealing for educators striving to support access to the full range of instructional and social experiences available within their school. We encourage continued exploration of the place of peers within these evidence-based interventions.

Supplemental Material

Supplemental material for this article is available on the Focus on Autism website with the online version of this article.

References

Agran, M., Jackson, L., Kurth, J. A., Ryndak, D., Burnette, K., Jameson, M., Zagona, A., Fitzpatrick, H., & Wehmeyer, M. (2020). Why aren't students with severe disabilities being placed in general education classrooms: Examining the relations among classroom placement, learner outcomes, and other factors. *Research and Practice for Persons With Severe Disabilities*, *45*(1), 4–13. https://doi.org/10.1177/1540796919878134

Asmus, J. M., Carter, E. W., Moss, C. K., Biggs, E. E., Daniel, M., Born, T. L., Bottema-Beutel, K., Brock, M. E., Cattey, G. N., Cooney, M., Fesperman, E. S., Hochman, J. M., Huber, H. B., Lequia, J. L., Lyons, G. L., Vincent, L. B., & Weir, K. (2017). Efficacy and social validity of peer network interventions for high school students with severe disabilities. *American Journal on Intellectual and Developmental Disabilities*, *122*(2), 118–137. https://doi.org/10.1352/1944-7558-122.2.118

Asmus, J. M., Carter, E. W., Moss, C. K., Born, T. L., Vincent, L. B., Lloyd, B. P., & Chung, Y. (2016). Social outcomes and acceptability of two peer-mediated interventions for high school students with severe disabilities: A pilot survey. *Inclusion*, *4*(4), 195–214. https://doi.org/10.1352/2326-6988-4.4.195

Bensted, E. A. (2000). *The academic effects of low achieving or inattentive students providing peer support to students with moderate to severe disabilities in general education classrooms* (Publication No. MQ52783) [Master's thesis], University of Victoria.

Biggs, E. E., & Carter, E. W. (2017). Supporting the social lives of students with intellectual disability. In M. L. Wehmeyer & K. A. Shogren (Eds.), *Handbook of research-based practices for educating students with intellectual disability* (pp. 235–254). Routledge.

Biggs, E. E., Carter, E. W., & Gilson, C. B. (2019). A scoping review of the involvement of children's communication partners in aided AAC modeling interventions. *American Journal*

of Speech Language Pathology, *28*(2), 743–758. https://doi.org/10.1044/2018_AJSLP-18-0024

Biggs, E. E., Carter, E. W., & Gustafson, J. R. (2017). Efficacy of collaborative planning and peer support arrangements to increase peer interaction and AAC use in inclusive classrooms. *American Journal on Intellectual and Developmental Disabilities*, *122*(1), 25–48. https://doi.org/10.1352/1944-7558-122.1.25

Brain, T., & Mirenda, P. (2019). Effectiveness of a low-intensity peer-mediated intervention for middle school students with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *62*, 26–38. https://doi.org/10.1016/j.rasd.2019.02.003

Brock, M. E., & Carter, E. W. (2016). Efficacy of teachers training paraprofessionals to implement peer support arrangements. *Exceptional Children*, *82*(3), 354–371. https://doi.org/10.1177/0014402915585564

Brock, M. E., & Huber, H. B. (2017). Are peer support arrangements an evidence-based practice? A systematic review. *The Journal of Special Education*, *51*(3), 150–163. https://doi.org/10.1177/0022466917708184

Carter, E. W. (2021). Peer-mediated support interventions for students with autism spectrum disorders. In P. A. Prelock & R. McCauley (Eds.), *Treatment of autism spectrum disorders: Evidence-based intervention strategies for communication and social interactions* (2nd ed.,) (pp. 315–352). Brookes.

Carter, E. W., Cushing, L. S., Clark, N. M., & Kennedy, C. H. (2005). Effects of peer support interventions on students' access to the general curriculum and social interactions. *Research and Practice for Persons With Severe Disabilities*, *30*(1), 15–25. https://doi.org/10.2511/rpsd.30.1.15

Carter, E. W., Dykstra Steinbrenner, J. R., & Hill, L. J. (2019). Exploring feasibility and fit: Peer-mediated interventions for high school students with autism spectrum disorders. *School Psychology Review*, *48*(2), 157–169. https://doi.org/10.17105/SPR-2017-0112.V48-2

Carter, E. W., Gustafson, J. R., Sreckovic, M. A., Dykstra Steinbrenner, J. R., Pierce, N. P., Bord, A., Stabel, A., Rogers, S., Czerw, A., & Mullins, T. (2017). Efficacy of peer support interventions in general education classrooms for high school students with autism spectrum disorder. *Remedial and Special Education*, *38*(4), 207–221. https://doi.org/10.1177/0741932516672067

Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J., & Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders*, *3*(4), 877–889. https://doi.org/10.1016/j.rasd.2009.04.003

Council for Exceptional Children. (2014). Council for Exceptional Children: Standards for evidence-based practices in special education. *TEACHING Exceptional Children*, *46*(6), 206–212. https://doi.org/10.1177/0040059914531389

Cushing, L. S., & Kennedy, C. H. (1997). Academic effects of providing peer support in general education classrooms on students without disabilities. *Journal of Applied Behavior Analysis*, *30*(1), 139–151. https://doi.org/10.1901/jaba.1997.30-139

Dymond, S. K., Rooney-Kon, M., Burke, M. M., & Agran, M. (2020). Characteristics of secondary age students with intellectual disability who participate in school-sponsored extracurricular activities. *The Journal of Special Education*, *54*(1), 51–62. https://doi.org/10.1177/0022466919851194

Giangreco, M. F. (2010). One-to-one paraprofessionals for students with disabilities in inclusive classrooms: Is conventional wisdom wrong? *Intellectual and Developmental Disabilities*, *48*(1), 1–13. https://doi.org/10.1352/1934-9556-48.1.1

Haring, T. G., Breen, C., Pitts-Conway, V., Lee, M., & Gaylord-Ross, R. (1987). Adolescent peer tutoring and special friend experiences. *Research and Practice for Persons with Severe Disabilities*, *12*(4), 280–286. https://doi.org/10.1177/154079698701200404

Hudson, M. E., Browder, D. M., & Wood, L. A. (2013). Review of experimental research on academic learning by students with moderate and severe intellectual disability in general education. *Research and Practice for Persons with Severe Disabilities*, *38*(1), 17–29. https://doi.org/10.2511/027494813807046926

Hughes, C., Copeland, S. R., Guth, C., Rung, L. L., Hwang, B., Kleeb, G., & Strong, M. (2001). General education students' perspectives on their involvement in a high school peer buddy program. *Education and Training in Mental Retardation and Developmental Disabilities*, *36*(4), 343–356. https://www.jstor.org/stable/23879896

Hughes, C., Kaplan, L., Bernstein, R., Boykin, M., Reilly, C., Brigham, N., Cosgriff, C., Heilingoetter, J., & Harvey, M. (2012). Increasing social interaction skills of secondary school students with autism and/or intellectual disability: A review of interventions. *Research and Practice for Persons With Severe Disabilities*, *37*(4), 288–307. https://doi.org/10.2511/027494813805327214

Hunsaker, A. (2014). *The effects of peer tutoring on junior high general education students' attitudes toward students with severe disabilities* [Unpublished master's thesis]. https://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=5404&context=etd

Hussar, B., Zhang, J., Hein, S., Wang, K., Roberts, A., Cui, J., Smith, M., Bullock Mann, F., Barmer, A., & Dilig, R. (2020). *The condition of education 2020*. National Center for Education Statistics.

Kuntz, E., & Carter, E. W. (2019). Review of interventions supporting secondary students with intellectual disability in general education classrooms. *Research and Practice for Persons with Severe Disabilities*, *44*(2), 103–121. https://doi.org/10.1177/1540796919847483

Ledford, J. R., Lane, J. D., Zimmerman, K. N., Chazin, K. T., & Ayres, K. A. (2016). *Single case analysis and review framework (SCARF)*. http://ebip.vkcsites.org/scarf/

Leigers, K., Kleinert, H. L., & Carter, E. W. (2017). "I never truly thought about them having friends": Equipping schools to foster peer relationships. *Rural Special Education Quarterly*, *36*(2), 73–83. https://doi.org/10.1177/8756870517707711

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, *6*(7), 1–6. https://doi.org/10.1371/journal.pmed.100009

Odluyurt, S., Tekin-Iftar, E., & Ersoy, G. (2014). Effects of school counselor supervised peer tutoring in inclusive settings on meeting IEP outcomes of students with developmental disabilities. *Education and Training in Autism and*

Developmental Disabilities, *49*(3), 415–428. https://www.jstor.org/stable/23881262

Odom, S. L. (2019). Peer-based interventions for children and youth with autism spectrum disorder: History and effects. *School Psychology Review*, *48*(2), 170–176. https://doi.org/10.17105/SPR-2019-0019.V48-2

Regelski, R. E. (2016). *The effectiveness of peer-assisted learning strategies on reading comprehension for students with autism spectrum disorder* (Publication No. 10298835) [Doctoral dissertation]. University of Pittsburgh.

Schaefer, J. M., Cannella-Malone, H. I., & Carter, E. W. (2016). The place of peers in peer-mediated interventions for students with intellectual disability. *Remedial and Special Education*, *37*(6), 345–356. https://doi.org/10.1177/0741932516629220

Skipper, J. (2011). *A group intervention for adolescents with Asperger syndrome or high-functioning autism and anxiety in mainstream secondary settings: An evaluation study* (Publication No. 10061448) [Doctoral dissertation]. University of East London.

Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N., Yücesoy-Özkan, S., & Savage, M. N. (2020). *Evidence-based practices for children, youth, and young adults with autism*. Frank Porter Graham Child Development Institute.

Stroman, K. (2019). *The impact of peer mediated instructional strategies in an inclusive project based learning environment* (Publication No. 13858484) [Doctoral dissertation]. University of South Carolina.

Tekin-Iftar, E. (2003). Effectiveness of peer delivered simultaneous prompting on teaching community signs to students with developmental disabilities. *Education and Training in Developmental Disabilities*, *38*(1), 77–94. https://www.jstor.org/stable/23880187

Travers, H. E., & Carter, E. W. (2021). A systematic review of how peer-mediated interventions impact students without disabilities. *Remedial and Special Education*, 1–18. https://doi.org/10.1177/0741932521989414

Van der Klift, E., & Kunc, N. (2002). Beyond benevolence: Supporting genuine friendship in inclusive schools. In J. Thousand, R. Villa, & A. Nevin (Eds.), *Creativity and collaborative learning: A practical guide to empowering students, teachers, and families* (2nd ed., pp. 21–28). Brookes.