Research Article

How Do Peers Benefit From Peer-Mediated Interventions? Examining Impact Within Secondary and Postsecondary Programs

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Abstract

Peer-mediated interventions (PMIs) are evidence-based practices that improve outcomes for students with intellectual and developmental disabilities (IDD). Determining whether peers also benefit substantively from their involvement in these widely used practices is key to establishing the reciprocity of PMIs. This study examined the breadth and depth of ways that peers perceive they are impacted by their experiences in PMIs and the factors that shape this impact. More than 250 secondary and postsecondary peers completed the *Peer-Mediated Impact Survey for Peers* (*PMIS:P*). Peers reported being impacted in multiple positive ways clustered within seven thematic areas: rewarding impact, advocacy impact, changes in views, future impact, social impact, skill and intrapersonal development, and self-worth impact. Several factors were associated with variations in peer impact, including having supported at least one student with autism, supported at least one student who was nonverbal, prior familiarity with a student, received ongoing support from an educator or other school staff, and more time spent together. We provide recommendations for research and practice aimed at addressing the myriad benefits of involving peers in PMIs.

Keywords

peer-mediated intervention, peers, intellectual and developmental disability

Increasing the inclusion of students with disabilities is a principal goal of numerous legislative, policy, and research initiatives (e.g., Agran et al., 2020; Individuals with Disabilities Education Improvement Act [IDEIA], 2004; Morningstar et al., 2016). However, ensuring that students with intellectual and developmental disabilities (IDD) participate fully in the life of their school remains a challenging task, particularly at the secondary (i.e., middle and high school) and postsecondary (i.e., college) levels. Peer-mediated interventions (PMIs) are a powerful set of approaches for supporting the social and academic participation of students with IDD. PMIs refer to formal and sustained experiences in which peers without disabilities are taught or directed by an adult to implement instructional programs, implement behavioral interventions, and/or facilitate social interactions in support of students with disabilities (Chan et al., 2009).

The most frequently examined PMIs in secondary and postsecondary schools include peer support arrangements, peer networks, peer partner programs, and peer mentoring (see literature reviews by Carter, 2018; Carter & McCabe, 2021; Travers & Carter, 2021). These interventions vary in numerous ways,

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including the criteria used to select peers and students, the roles peers assume, the extent or type of training peers receive, the locations in which students spend time together, the duration of their involvement, and the nature of educator support. However, a consistent feature of PMI approaches is that similar-age peers support their fellow schoolmates to interact, engage, and/or learn. Numerous reviews document the positive impact PMIs can have on the social, academic, and behavioral outcomes of students with IDD (e.g., Brock & Huber, 2017; Kuntz & Carter, 2019; Watkins et al., 2017; Wong et al., 2014). Indeed, PMIs are widely considered an evidence-based practice for improving educational outcomes among youth and young adults with IDD.

Despite decades worth of research documenting the positive impact PMIs have on students with disabilities, far less is known about the outcomes for the peers without IDD who are so central to these interventions. Peers are an active and prominent part of every PMI. Indeed, many PMIs actually involve more peers than students with disabilities. For example, peer networks involve three to six peers supporting one student with an IDD and peer support arrangements involve two to three peers. In the absence of some anticipated benefit, educators and parents may be reluctant to formally involve peers in the education and support of students with IDD. Moreover, PMIs have long been promoted as mutually beneficial and socially valid practices (Copeland et al., 2002; Kamps et al., 1998; Odom, 2019). Determining whether peers also experience an array of personal benefits through their ongoing participation is key to establishing their reciprocity.

Three recent literature reviews have focused on the ways in which PMIs can impact peers in secondary and postsecondary settings (Carter & McCabe, 2021; Schaefer et al., 2016; Travers & Carter, 2021). Each synthesis of studies indicates that peers can benefit in varied and vital ways. For example, potential benefits have included the areas of social relationships (e.g., development of friendships, increased interactions), academic impacts (e.g., increased engagement, improved grades), personal growth (e.g., greater empathy, self-worth), skill development (e.g., communication, time management), future intentions (e.g., new career plans), and changed views regarding disability (e.g., improved attitudes, increased advocacy). However, these reviews reveal three key limitations regarding the prevailing measurement of peer impact. First, the examination of peer impact within individual studies tends to be very narrow and is usually considered supplemental. In other words, most researchers only incorporate a few survey or interview questions asking peers about the ways in which they benefited from involvement in a PMI. Such questions are rarely considered a primary purpose of the study and little space is usually devoted to peers' responses within articles. Second, examination of peer impact is typically limited to just one or a few areas of impact (e.g., social relationships, personal growth, and changed views). Yet, these three scoping reviews have collectively identified dozens of different ways in which peers might be impacted by their involvement in a PMI. A much broader approach to measurement is needed to fully capture the difference these interventions make for peers. Third, the psychometric properties of the peer-related measures used in most prior studies are uncertain, unreported, or questionable. Instead, individual questions and peer surveys tend to be unique to each study and developed by the researchers. New studies are needed that take a more comprehensive look at peer impact and use tools that are valid and reliable.

In addition to determining whether peers benefit from their involvement in PMI, it is also important to understand the various factors that could influence how peers benefit. As noted previously, PMI approaches can vary widely within and across schools. Moreover, peers come to these experiences from a range of backgrounds. Yet, the ways in which each peer's experiences might shape their own outcomes have received little attention. Travers (2021) held eight focus groups with 41 secondary and postsecondary peers about their experiences participating in PMIs involving students with IDD. Through the qualitative analyses, several factors emerged as having potential salience. These included the amount of time peers spent with the students whom they supported (e.g., number of years they were involved, frequency with which students get together), the age of the peers, and the nature of the support they provided (e.g., academic-focused, social-focused). Other factors may also matter, such as the types of disabilities and support needs of participating students, whether peers and students had a relationship prior to the PMI, whether peers received formal training (vs. simply being asked to work together), and the availability of educator or school staff support. Knowing more about these potential factors could help educators design experiences that maximize benefits for all students.

In this article, we describe findings from a large-scale study of secondary and postsecondary peers who had recent involvement in a PMI at their school. We addressed the following research questions:

RQ1: How do peers perceive they are impacted by their PMI experiences?
RQ2: What factors are associated with the perceived benefits peers report?

Method

Inclusion Criteria

To be included in this study, peers must have (a) participated in an in-person PMI focused on students with IDD during the 2019–2020 or 2020–2021 school year; (b) attended a middle school, high school, or college while involved in the PMI; (c) spoken English as a primary language; and (d) had access to technology that allowed for the completion of an online survey. These PMI experiences could include peer networks, peer support arrangements, peer tutoring programs, peer partner programs (e.g., *Peer to Peer*, *Best Buddies*), or peer mentorship program.

Recruitment Procedures

After obtaining institutional review board approval, we worked with a large number of program leaders and school contacts to obtain a sample of peers meeting our inclusion criteria. Our goal was to recruit peers involved in a wide range of PMI programs as we wanted to examine peer impact across varied types of peer experiences. Unfortunately, there is no existing list of schools that adopt PMIs. Therefore, we generated a list of key individuals around the country who we knew would be in a position to assist in distributing invitations to a large number of peers who had participated in a PMI. We emailed each person, using their publicly available email or email we had as a result of professional relationships, asking to speak with them about the purpose of the study, the inclusion criteria (i.e., the types of PMI experiences peers must have been involved in to participate), and how our study findings would be shared back with them. We also asked to be connected to the PMI point person (e.g., school-level peer program coordinator, special educator) who could send initial recruitment emails to peers or their parents (for those below 18 years) on our behalf. We received recruitment assistance from one project director for a statewide peer partner program; six educators and administrators from Tennessee, Kentucky, and Arizona who were actively implementing PMI programs with their students; 17 Best Buddies state directors and the national director; and 20 program staff from inclusive higher education programs who supported peer mentoring programs.

The recruitment email sent to parents/guardians of peers (18 years of age or older) included information about the study and a link to an electronic consent form. Once parent/guardian consent was provided, we emailed study information to their child and a link to both an electronic assent form and the survey. To encourage participation, we indicated that each peer who completed the survey could enter their name in a drawing for one of 30 US$20 gift cards to a choice of stores.

Survey Procedures

The survey was completed online using the secure web-based platform REDCap (Harris et al., 2009) during the Fall of 2021. The survey included four main sections with instructions provided using both text and video. We describe each section next. Because the COVID-19 pandemic closed many schools and shifted some PMI experiences to a virtual context during this time frame, we asked peers to report on their in-person experience when responding to all items. If peers were unable to meet in-person during the 2020–2021 school year, we asked them to refer to their 2019–2020 in-person PMI experiences when answering questions.

Peer demographics. The first section requested information about their personal demographics, prior experience with individuals with IDD, and prior experience with the students whom they supported as part of their PMI (see Table 1 for items and response options).

Student demographics. The second section requested information about the number of students with IDD peers supported, along with the demographics and disability information for those students (see Table 2 for items and response options).

PMI descriptions. The third section requested information on the nature of their PMI experiences, including the ways peers were recruited, the training they received, the groupings of students, the settings for the PMI (middle and high school only), the roles of peer mentors (postsecondary school only), the frequency of contact, the duration of the experience, and any past experiences in PMIs (see Table 3 for items and response options).

Peer impact. The fourth section of the survey asked peers to respond to a new measure called the *Peer-Mediated Impact Survey for Peers* (*PMIS:P*). This valid and reliable measure requires peers to respond to 46 items and report how they were impacted by their most recent or current PMI experiences (see Travers, 2021, for a description of its initial development and piloting). Each of the 46 items is represented within seven thematic areas: (a) skill and intra-personal development, (b) self-worth impact, (c) changes in views, (d) social impact, (e) advocacy impact, (f) rewarding impact, and (g) future impact. Example items include "I am a better advocate for people with disabilities," "I have more favorable views toward inclusion," and "I developed a friendship with the student(s) with disabilities whom I supported" (see Table 4 for a complete list of measure items). Each item begins with the same stem: "Because of my experience in a peer program. . .". Peers rate their level of agreement with each statement using a 6-point Likert-type scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *somewhat agree*, 5 = *agree*, 6 = *strongly agree*. The PMIS:P instructions emphasize peers should think about their PMI experience when rating each item and only rate impacts that were specifically a result of their PMI experience. For example, if they felt that they were patient prior to their experience and their patience had neither increased nor decreased after having participated in their peer program, they are asked to select one of the three levels of disagreement. If they felt that their patience had indeed changed as a result of their PMI involvement, they are asked to select one of the three levels of agreement. The PMIS:P concludes with two optional, open-ended items. First, peers are asked to address any ways in which they feel they have changed for the worse because of their experience in a peer program (e.g., I became a worse listener, I am less patient). Second, peers are asked to share any additional thoughts related to how they were impacted by their experiences.

Validity and reliability of the PMIS:P. A factor analysis indicated that the seven impact areas accounted for 53.9% of the total variance explained. Cronbach's alpha coefficient for the overall PMIS:P measure was .96 and internal consistency was also high for each of the seven impact areas (range = .74–.92). The correlation between overall ratings of peers who took the PMIS:P twice, 2 weeks apart, was strong and positive (r = .79, $p < .001$). The percentage of exact match agreements averaged 58.1% per participant (range = 4.3%–100%). The percentage of broad match agreements (i.e., peers agreed with an item at both time points or disagreed with an item at both time points) averaged 94.7% (range = 41.3%–100%) across items.

Data Analysis

RQ1 focused on how peers perceive they were impacted by their experiences within a PMI. We used descriptive statistics (e.g., percentages, means, and standard deviations) to summarize peer ratings on the PMIS:P. We focused on level of individual items, the seven impact areas, and the overall scale. In addition, we calculated the mean, median, and standard deviation for the total number of different items for which each peer agreed they were impacted (i.e., *somewhat agree, agree*, or *strongly agree*), the total number of different items for which peers *agreed* or *strongly agreed* they were impacted, and the total number of

Table 1. Demographic Information for Peers ($N = 277$).

Variable	*n*	%
Age		
12–15	42	15.2
16–18	113	40.6
19–21	97	34.8
22+	26	9.3
School level when peer participated in PMI		
Middle school (seventh–eighth grade)	6	2.1
High school (ninth–12th grade)	139	50.0
College	133	47.9
Sex		
Female	237	85.3
Male	36	12.9
Other	3	1.1
Prefer not to say	2	0.7
Race/ethnicity		
American Indian or Alaska Native	2	0.7
Asian	15	5.4
Black or African American	7	2.5
Hispanic/latino	27	9.7
Multiracial	17	6.1
White/non-Hispanic	228	82.0
Other	3	1.1
Prefer not to say	4	1.4
Peer identifies as someone with a disability[a]	13	4.7
Autism spectrum disorder	2	0.7
Emotional disturbance	5	1.8
Hearing impairment	1	0.4
Intellectual disability	1	0.4
Learning disability	6	2.2
Other health impairment	3	1.1
Speech and language impairment	1	0.4
Visual impairment/Blind	2	0.7
Other	5	1.8
Experience with individuals with IDD prior to PMI[a]	213	76.6
Previous experience in a peer program	104	37.4
Friend with an IDD	101	36.3
In a class with someone with an IDD, interacted often	87	31.3
Family member with an IDD	67	24.1
In a class with someone with an IDD, but didn't interact often	51	18.3
On a sports team with someone with an IDD	19	6.8
Other	31	11.2
Peer familiarity with at least one student(s) with an IDD involved in PMI[a]	87	31.3
Shared a class and interacted often	25	9.0
Shared a class, but did not interact often	11	4.0
Familiar from school, but did not share any classes	38	13.7
On a sports team together	8	2.9
Attend the same place of worship	6	2.2
In a school club together	26	9.4
Other	14	5.0

(continued)

Table 1. (continued)

Variable	*n*	%
Number of years peer participated in any PMI		
Less than 1 year	26	9.4
About 1 year	23	8.3
1–2 years	85	30.7
2–3 years	68	24.5
More than 3 years	74	26.7
Not reported	1	0.4
Recruitment method for middle/high school peers only[a]		
Friend who had already participated in the PMI	65	44.8
Volunteered after seeing a flyer at school	55	37.9
Volunteered after someone made an announcement about the program in a class	49	33.8
Friend who planned to participate	37	25.5
Special education teacher	24	16.6
General education teacher	13	9.0
School staff member (not a teacher or paraprofessional)	4	2.8
Do not remember	3	1.1
Other (e.g., saw a video online, family member recommended participation)	17	11.7
Recruitment method for college peers only[a]		
Volunteered after seeing a flyer on campus	49	37.1
Friend who had already participated as a peer	33	25.0
Chose to attend their college/university because of the opportunities to support students with IDD enrolled in the inclusive higher education program	22	16.7
PMI program staff member	20	15.2
Friend who planned to participate	12	9.1
Professor not involved in the peer program	10	7.6
Do not remember	3	2.3
Other (e.g., student with disabilities encouraged them, received an email about the program, required part of a college course).	14	10.6
Peer training prior to PMI[a]	144	52.0
Verbal description of the PMI	120	43.3
Explanation of purpose of the PMI	119	43.0
Information related to disabilities	109	39.4
Opportunity to ask questions	106	38.3
Written description of the PMI	99	35.7
Adult modeling of how to provide support to the student(s)	51	18.4
A video model	47	17.0
Instructions on how to collect data on the student(s)	42	15.2
Opportunity to practice or implement the PMI	27	9.7
Do not remember	2	0.7
Other	2	0.7

Note. PMI = peer-mediated intervention; IDD = intellectual and developmental disabilities.
[a]Peers could select multiple response options.

items for which peers *strongly agreed* they were impacted. RQ2 focused on the factors that may be associated with the extent to which peers agree they benefited. Here, we examined the extent to which the following 11 variables were significantly related to mean ratings on the overall PMIS:P: (a) prior experience with people with IDD, (b) having prior familiarity with the student(s) with IDD whom the peers supported, (c) working with at least one student with an intellectual disability, (d) working with at least one student with autism spectrum disorder (ASD), (e) working with at least one student who is nonverbal (i.e., does

Table 2. Demographic Information About the Students With Whom Peers Worked.

Variable	*n*	%
Disabilities of students[a]		
Autism spectrum disorder	151	54.3
Down syndrome	114	41.0
Intellectual disability	136	48.9
Multiple disabilities	94	33.8
Other	14	5.0
I don't know	79	28.4
School level of student with IDD[a]		
Middle school (sixth–eighth grade)	30	9.9
High school (ninth–12th grade)	150	49.3
College	124	40.8
Sex of student with IDD[a]		
Female	189	68.0
Male	202	72.7
I prefer not to say	3	1.1
Race/ethnicity of students with IDD[a]		
American Indian or Alaska native	6	2.2
Asian	54	19.4
Black or African American	81	29.1
Hispanic/Latino	49	17.6
Multiracial	41	14.7
Native Hawaiian or Pacific Islander	7	2.5
White/non-Hispanic	215	77.3
Other	12	4.3
Prefer not to say	7	2.5
I don't know	32	11.5
Primary communication modes of students with IDD[a]		
Verbal	260	93.5
Gestures (e.g., pointing to something they want)	90	32.4
Communication devices	48	17.3
Pictures	31	11.2
Manual signs (e.g., sign language)	23	8.3
Other	1	0.4

Note. IDD = intellectual and developmental disabilities.
[a]Peers could select multiple response options.

not use verbal speech to communicate), (f) receiving training prior to PMI, (g) receiving ongoing support from an educator or school staff member, (h) age of peer, (i) frequency with which peers provided support (i.e., once a week, once a day, multiple times a week, once every few weeks), (j) duration of PMI (i.e., less than a semester, about one semester, one school year), and (k) length of time peers were involved in any PMI (i.e., less than 1 year, about 1 year, 1–2 years, 2–3 years, more than 3 years).

We selected all variables a priori based on the findings from our examination of prior literature reviews and our focus group findings (Travers, 2021). The only variable that we altered slightly post-data collection was *working with at least one student who is nonverbal (i.e., does not use verbal speech to communicate)*. In Section 2 of the survey, we asked peers to select all the ways in which the students they supported communicate. Response options included *verbally*, *with pictures*, *with manual signs (e.g., sign language)*, *with gestures (e.g., pointing to something they want)*, *with a communication device*, and *other.* Because many peers worked with multiple students, to simplify interpretation of this variable, we decided to collapse the response option categories into *verbal* and *nonverbal*.

Table 3. Characteristics of Reported PMI Experiences.

Variable	*n*	%
PMI grouping		
Paired with one student with IDD	132	47.5
Paired with multiple students with IDD	101	36.3
In the same group or on the same team as someone with IDD	37	13.3
Other	8	2.9
PMI settings for middle and high school peers only[a]		
Lunch or other noninstructional time of the day	100	36.1
Outside of school	52	18.8
Special education classroom	51	18.4
General education classroom	36	13.0
Other	5	1.8
PMI roles for college peers only[a]		
Academic support or tutor	66	23.8
Daily planning tutor	21	7.6
Exercise support	22	7.9
In-class support	36	13.0
Mealtime support	31	11.2
Roommate or residential life support	5	1.8
Social inclusion support	73	26.4
Work or internship support	20	7.2
Other	7	2.5
Established PMI programs[a]		
Best Buddies	156	56.3
Unified Sports	30	10.8
Peer to Peer	26	9.4
Frequency of contact during PMI		
Multiple times a day	26	9.4
Once a day	36	13.0
A few times a week	107	38.6
Once a week	77	27.8
Once every few weeks	26	9.4
Not reported	5	1.8
Duration of PMI		
Less than a semester	1	0.4
About one semester	68	24.5
About one school year	198	71.5
Not reported	10	3.6
Ongoing coaching and support during PMI	218	78.7

Note. PMI = peer-mediated intervention; IDD = intellectual and developmental disabilities.
[a]Peers could select multiple response options.

For dichotomous variables (the first seven variables), we used the Mann–Whitney *U* test to determine whether the differences between groups were significant. This nonparametric statistical test was selected because the distributions for the total PMIS:P scores and each of the seven factor scores were not normally distributed, even after transformation. For continuous variables (the last four variables), we used Spearman's rank-order correlations. When a variable was found to be significantly related to differences in mean PMIS:P ratings, we also explored the degree to which the variable was associated with differences in mean ratings on each of the seven PMIS:P factors. We focused on the magnitude of any

Table 4. Peer Ratings of Impact on the PMIS:P.

	Percentage of peers responding						
Factor/item	SD	D	SWD	SWA	A	SA	*M* (*SD*)
Rewarding impact							5.56 (0.55)
It felt good helping others.	0.0	0.0	0.0	6.9	22.4	70.8	5.64 (0.61)
It felt rewarding to help the student(s) with disabilities whom I supported to succeed.	0.0	0.0	0.4	7.6	27.8	64.3	5.56 (0.65)
I feel good knowing that I made a difference in the life of someone else.	0.0	0.0	0.7	9.4	31.0	58.8	5.48 (0.70)
Advocacy impact							5.54 (0.55)
I am more likely to speak up when students with disabilities are bullied.	0.0	0.7	0.4	3.6	21.7	73.6	5.67 (0.63)
I am more likely to speak up when others use disparaging language about disability.	0.0	0.7	0.0	7.2	23.8	68.2	5.59 (0.69)
I am more comfortable around people with disabilities.	0.0	1.1	1.4	4.7	22.7	70.0	5.59 (0.74)
I am a better advocate for people with disabilities.	0.0	0.0	1.4	9.0	34.3	55.2	5.43 (0.72)
I am better able to educate my friends and family about what it means to have a disability.	0.0	0.0	1.4	12.3	27.8	58.5	5.43 (0.76)
Changes in views							5.38 (0.55)
I learned that each individual with disabilities possesses unique strengths.	0.0	0.0	1.4	5.8	23.8	69.0	5.60 (0.67)
My views of people with disabilities have been positively impacted.	0.0	0.4	0.7	4.7	29.2	65.0	5.58 (0.65)
I have more favorable views toward inclusion.	0.0	0.4	1.8	7.6	26.4	63.9	5.52 (0.75)
I learned to see beyond disability labels.	0.0	1.1	1.4	7.6	28.2	61.7	5.48 (0.79)
I think that people with disabilities are more similar to me than different.	0.0	0.0	2.9	9.0	32.5	55.6	5.41 (0.77)
I am more understanding of others.	0.0	0.0	1.4	7.6	44.8	46.2	5.36 (0.69)
I talked with someone I would not normally talk to.	0.7	3.2	5.8	12.6	27.8	49.8	5.13 (1.12)
I recognize the misconceptions I used to have about people with disabilities.	0.4	3.6	6.1	15.2	36.1	38.6	4.99 (1.08)
Future impact							5.37 (0.60)
I want to continue to support students with disabilities while I am still in school.	0.0	0.4	0.7	1.8	25.3	71.8	5.68 (0.59)
I learned skills that will help me in my future career.	0.0	0.4	1.1	8.3	23.1	67.1	5.56 (0.72)
I am more motivated to be a role model for others.	0.0	0.4	1.1	11.6	30.3	56.7	5.42 (0.77)
I am more open to a career where I can support people with disabilities	0.7	2.2	2.9	15.9	26.0	52.3	5.21 (1.03)
I am more excited about going to school/being at this college.	0.7	2.5	4.7	20.2	28.2	59.9	5.00 (1.07)
Skill and intrapersonal development							5.03 (0.68)
I am more patient with others.	0.0	0.4	1.4	11.2	36.1	50.9	5.36 (0.77)
I developed stronger teaching/mentoring skills.	0.0	0.4	2.9	9.7	34.7	52.3	5.36 (0.80)
I learned how to communicate more effectively.	0.0	0.7	2.2	11.2	39.4	46.6	5.29 (0.81)
I am more compassionate.	0.0	0.7	2.2	13.4	27.2	46.6	5.27 (0.83)
My communication skills improved.	0.0	0.4	3.6	12.3	37.9	45.8	5.25 (0.84)
I am more open-minded.	0.0	0.7	1.1	15.2	40.1	43.0	5.23 (0.80)
My leadership skills improved.	0.0	1.1	3.6	4.7	19.5	53.8	5.21 (0.90)
I am more kind.	0.4	1.4	3.6	16.6	39.0	39.0	5.09 (0.94)
I am a better listener.	0.0	1.1	2.9	17.0	45.8	33.2	5.07 (0.84)
My conflict management skills improved.	0.4	3.6	6.9	24.2	33.6	68.6	4.81 (1.09)

(continued)

Table 4. (continued)

Factor/item	Percentage of peers responding						
	SD	D	SWD	SWA	A	SA	*M* (*SD*)
I improved my problem-solving skills.	0.0	3.2	7.9	22.0	40.1	26.7	4.79 (1.03)
I am more reflective.	0.0	0.4	2.9	10.1	30.7	27.8	4.67 (1.10)
I am better at setting healthy personal boundaries.	0.4	5.1	12.3	20.9	36.5	24.9	4.63 (1.15)
My time-management skills improved.	1.1	8.7	11.6	31.4	23.1	24.2	4.39 (1.27)
Social impact							5.00 (0.89)
I developed a friendship with the student(s) with disabilities whom I supported.	0.0	1.1	1.1	7.6	26.0	64.3	5.51 (0.77)
I found a community of students at school who welcome me and make me feel included.	0.4	2.2	4.0	20.2	33.9	39.4	5.03 (1.01)
I developed relationships with students with disabilities that will be long-lasting.	1.4	2.5	4.7	19.9	27.4	44.0	5.01 (1.14)
I spent/spend time with the student(s) with disabilities I supported outside of my peer program.	4.3	10.5	8.3	20.9	25.6	30.3	4.44 (1.48)
Self-worth impact							4.73 (0.83)
I am more appreciative of life.	0.0	1.1	5.1	22.0	30.3	41.5	5.06 (0.97)
I felt needed.	0.0	2.5	9.4	19.5	32.1	36.5	4.91 (1.08)
I feel better about myself.	0.0	4.3	5.1	27.8	33.6	29.2	4.78 (1.06)
I am more patient with myself.	1.4	4.0	7.9	26.4	33.2	27.1	4.67 (1.16)
I gained a greater sense of self-worth.	0.4	4.3	9.4	27.4	34.7	23.8	4.63 (1.10)
I am more confident.	0.7	5.1	6.5	31.8	32.9	23.1	4.60 (1.11)
My overall mental health improved.	0.7	6.5	10.5	32.5	27.8	22.0	4.46 (1.18)

Note. SD = *strongly disagree*; D = *disagree*; SWD = *somewhat disagree*; SWA = *somewhat agree*; A = *agree*; SA = *strongly agree*.

differences between groups by calculating *r*. We interpreted effect sizes using guidelines proposed by Cohen (1988): an *r* value of .20 was small, .40 was moderate, and .60 was large. Because we set up the online survey to require ratings for all PMIS:P items by peers, we had no missing data. We designed the survey this way so that we knew peers had considered each of the 46 impact items.

To analyze responses on the open-ended questions, we used a general inductive approach to analyzing qualitative data (Thomas, 2006). We first read through all responses. Then, we clustered responses based on similarities into a single topic. For example, if two students wrote in response to the first open-ended question that they felt guilty for not being more available to the students with whom they worked, we would cluster these responses together into the single topic "feeling guilty for not being available to students with IDD at all times of the day." We clustered all responses within each open-ended question where appropriate but retained all original or new responses for reporting. We report all response topics for each open-ended question next.

Results

Peer Demographics and Experiences

Surveys were completed by 277 peers residing in 25 different states. Participating peers were predominantly White (82.0%), female (85.3%), and the majority were between the ages of 16 and 21 years (75.4%). Demographic information for these peers is displayed in Table 1. Peers reported working with an average of five students with IDD (*Mdn* = 2) as part of their PMI experience. The students whom peers supported varied widely with regard to their demographics, disabilities, and primary communication modes (see Table 2). The nature of the peers' PMI experiences was also wide-ranging with regard to how students were grouped,

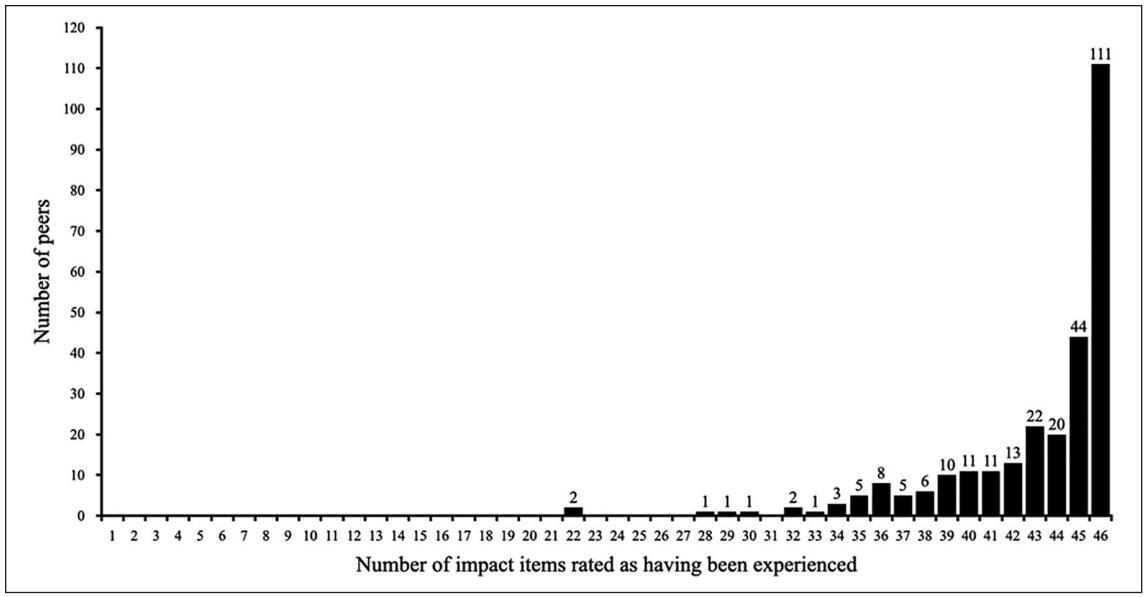

Figure 1. Number of different PMIS:P items rated as having been experienced by peers.
Note. PMIS:P = Peer-Mediated Impact Survey for Peers.

whether peers received ongoing coaching, the settings in which they spent time together, the roles of peers, and the frequency and duration of the peers' experiences (see Table 3).

How Do Peers Perceive They Are Impacted by Their Experiences?

Average peer ratings for the overall PMIS:P were quite high ($M = 5.17$, $SD = 0.54$). Table 4 displays peer ratings for individual items and each of the seven factors. The highest rated items included "My views of people with disabilities have been positively impacted" ($M = 5.58$, $SD = 0.65$), "I am more likely to speak up when others use disparaging language about disability" ($M = 5.59$, $SD = 0.69$), "I learned that each individual with disabilities possesses unique strengths" ($M = 5.60$, $SD = 0.67$), "I am more likely to speak up when students with disabilities are bullied" ($M = 5.67$, $SD = 0.63$), and "I want to continue to support students with disabilities while I am still in school" ($M = 5.68$, $SD = 0.69$). Moreover, the highest rated impact areas were rewarding impact, advocacy impact, and changes in views. However, average ratings for all 46 items were well above the mid-point of the scale. The number of unique items for which peers agreed at any level (i.e., *somewhat agree, agree, strongly agree*) averaged 43.1 (range = 22–46, *Mdn* = 45), the number of items for which peers *agreed* or *strongly agreed* averaged 36.2 (range = 9–46, *Mdn* = 38), and the number of items for which peers *strongly agreed* averaged 21.8 (range = 0–46, *Mdn* = 20). Taken together, these findings indicate that peers benefited in multiple ways from their experiences (see Figure 1).

Only 17 peers (6.1%) described any negative impacts when prompted with an open-ended question. These negative impacts included feeling stressed or defeated when the students whom they supported were not successful, feeling guilty for not being available to students with IDD at all times of the day, and over-extending themselves by putting too much time and energy into the peer program. In contrast, 139 peers (50.2%) elaborated on the positive impacts when prompted with the second open-ended question. Most of the peer responses echoed items already included on the PMIS:P (e.g., increased patience, improved communication skills). However, new areas of impact included gained greater respect for individuals with disabilities, their families, and their teachers; became a better problem-solver; learned about themselves; became more comfortable speaking with adults/authority figures; became more flexible; became more accepting of own disability; and became more self-aware.

What Factors Are Associated With the Benefits Peers Report?

Several factors were associated with higher average ratings on the overall PMIS:P. All differences were considered small in magnitude.

Students Who Are Nonverbal

PMIS:P scores for peers who worked with at least one student who does not use speech to communicate (*Mdn* = 5.3) were higher than for peers who did not support any nonverbal students (*Mdn* = 5.1). A Mann–Whitney *U* test indicated that this difference was statistically significant, $U = 10{,}788.5$, $p = .020$, $r = .14$. Follow-up comparisons identified higher ratings among peers who supported at least one nonverbal student in four impact areas: changes in views, $U = 10{,}888.5$, $p = .013$, $r = .15$; advocacy impact, $U = 10{,}606.0$, $p = .035$, $r = .13$; rewarding impact, $U = 10{,}748.5$, $p = .016$, $r = .14$; and future impact, $U = 10{,}737.0$, $p = .023$, $r = .14$. Nonsignificant differences were found for two areas of impact: self-worth impact ($r = .08$, $p = .161$) and skills impact ($r = .11$, $p = .075$).

Students With Autism

PMIS:P scores for peers who supported at least one student with autism (*Mdn* = 5.3) were higher than for peers who did not support these students (*Mdn* = 5.1). A Mann–Whitney *U* test indicated that this difference was statistically significant, $U = 11{,}210.0$, $p = .01$, $r = .15$. Follow-up comparisons identified higher ratings in five impact areas: social impact, $U = 11{,}206.5$, $p = .010$, $r = .15$; changes in views, $U = 10{,}986.5$, $p = .026$, $r = .13$; skills, $U = 11{,}026.5$, $p = .023$, $r = .14$; advocacy impacts, $U = 10{,}827.5$, $p = .041$, $r = .12$; and future impact, $U = 11{,}435.0$, $p = .003$, $r = .18$. Nonsignificant differences were found for self-worth impact ($r = .10$, $p = .102$) and rewarding impact ($r = .01$, $p = .893$).

Educator or School Staff Support

PMIS:P scores for peers who received ongoing support from an educator or school staff member (*Mdn* = 5.3) were higher than for peers who did not receive ongoing support (*Mdn* = 5.1). A Mann–Whitney *U* test indicated that this difference was statistically significant, $U = 4{,}025.5$, $p = .021$, $r = .14$. Follow-up comparisons identified higher ratings in two impact areas: social impact, $U = 3{,}870.5$, $p = .008$, $r = .16$, and future impact, $U = 4{,}190.5$, $p = .047$, $r = .12$. Nonsignificant differences were found for five areas of impact: self-worth impact ($r = .11$, $p = .059$), changes in views ($r = .10$, $p = .081$), skills impact ($r = .11$, $p = .074$), advocacy impact ($r = .10$, $p = .097$), and rewarding impact ($r = .06$, $p = .332$).

Prior familiarity. PMIS:P scores for peers who had prior familiarity with the students with IDD whom they supported (*Mdn* = 5.3) were higher than for peers without prior familiarity (*Mdn* = 5.2). A Mann–Whitney *U* test indicated that this difference was statistically significant, $U = 9{,}517.0$, $p = .043$, $r = .12$. Follow-up comparisons identified higher ratings in the area of social impact, $U = 9{,}958.0$, $p = .006$, $r = .17$. Nonsignificant differences were found for six areas of impact: self-worth impact ($r = .09$, $p = .114$), changes in views ($r = .02$, $p = .752$), skills impact ($r = .11$, $p = .068$) advocacy skills ($r = .10$, $p = .111$), rewarding impact ($r < .01$, $p = .989$), and future impact ($r = .11$, $p = .056$).

Frequency of contact. The correlation between spending more frequent time with a student with an IDD through a PMI and overall PMIS:P ratings was significant and positive, $\rho = .18$, $p = .003$. Follow-up analyses identified similar correlations for four impact areas: social impact, $\rho = .31$, $p < .001$; skills impact, $\rho = .14$, $p = .018$; advocacy impact, $\rho = .16$, $p = .008$; and future impact, $\rho = .20$, $p < .001$. We did not find significant correlations for three areas of impact: self-worth impact, $\rho = .10$, $p = .096$; changes in views, $\rho = .09$, $p = .160$; and rewarding impact, $\rho = .12$, $p = .054$.

Multiple PMI experiences. The correlation between years of participation in a PMI and overall PMIS:P ratings was significant and positive, $\rho = .16$, $p = .008$. Follow-up analyses identified similar correlations for four impact areas: social impact, $\rho = .26$, $p < .001$; skills impact, $\rho = .14$, $p = .024$; advocacy impact, $\rho = .14$, $p = .021$; and future impact, $\rho = .13$, $p = .036$. We did not find significant correlations for three areas of impact: self-worth impact, $\rho = .12$, $p = .051$; changes in views, $\rho = .06$, $p = .355$; and rewarding impact, $\rho = .07$, $p = .274$.

Other factors. None of the other factors we examined were related to overall PMIS:P ratings, including prior experience with people with IDD ($r = .06$, $p = .280$), supporting at least one student with an intellectual disability ($r = .08$, $p = .194$), receiving training prior to the PMI ($r = .05$, $p = .397$), peer age ($\rho = .04$, $p = .493$), or length of the PMI experience ($\rho = .02$, $p = .716$).

Discussion

Peers have a prominent place within PMIs. As PMIs are popular approaches for supporting and including students with IDD, it is essential that the educators and school staff who implement these interventions understand the impact on all students involved. This study examined the breadth of ways in which peers perceive they have been impacted by their experiences in PMIs, as well as the factors that may be associated with variations in their ratings of these benefits. Our findings extend the literature on the shared impact of PMIs in several important directions.

Youth and young adults who participate in PMIs in support of students with IDD report benefiting in a multitude of ways. This wide-ranging impact was evident both in the very high average ratings for most items and in the total number of items each peer affirmed that they experienced. Moreover, the impact on peers spanned multiple areas, including skill and intrapersonal development, self-worth, changes in views, social relationships, advocacy, sense of reward, and future intentions. These findings both echo and extend the findings of prior literature reviews focused on the benefits of PMIs for secondary and postsecondary peers (Carter & McCabe, 2021; Schaefer et al., 2016; Travers & Carter, 2021). Whereas prior studies have identified only a single area—or small number of areas—in which peers have been impacted, the current study indicates that the reach of these interventions can be much broader. Such findings can be used to advocate for the involvement of peers in the education and support of fellow students with IDD. When considered alongside the large literature addressing positive benefits for students with IDD, this study highlights the reciprocity of PMIs for all participants.

Although perceived impact was overwhelmingly positive, regardless of who peers worked with or supported (e.g., students with and without multiple disabilities, students with and without communication devices), there were still some variations in the overall ratings of benefits based on several different factors. For example, the types of students whom peers supported emerged as one influential factor. Specifically, peers who supported students with autism or students who were nonverbal tended to have even higher ratings on the PMIS:P than peers who did not have these experiences. Although we can only speculate, it may be that such students required more intensive or sustained support from peers. As a result, their changes in views about disability and their personal growth may have been more substantial. Likewise, the assistance that peers received from educators/staff was also a salient factor. Peers who reported having ongoing access to a special educator, paraprofessional, or other adult as part of their PMI were more likely to indicate that they developed new social relationships. Although we do not know exactly how educators/staff worked with these peers, it may be that their facilitation of social connections and modeling of support encouraged and allowed peers to comfortably pursue friendships with the students with IDD with whom they worked. Finally, the amount of time peers spent with students with IDD—weekly in their current PMI experience or overall across the years—was also associated with higher ratings on the PMIS:P. Students who accrued more experience working with and alongside their schoolmates with disabilities also accrued more benefits. This was particularly evident in the area of social impact, which emphasizes the relationships peers formed.

Interpreting differences based on these factors—or the absence of significant differences related to others—is quite difficult in light of the considerable variability of peer experiences reflected in this sample.

Even when multiple peers are part of the same peer-mediated program within the same school, the nature of each of their actual experiences can be quite different throughout the semester or school year. Moreover, most peers supported multiple students with IDD and often did so across multiple settings (e.g., special education classrooms, general education classrooms, cafeterias). Each of these variations may shape the degree to which the 46 impact areas addressed on the PMIS:P might be experienced by peers. Future research is needed to explore more closely what ongoing participation in a PMI looks like for secondary and postsecondary peers to better understand how those experiences contribute to future outcomes.

Finally, we were particularly intrigued by the advocacy impacts affirmed by so many of the peers in this study. This area of impact was rated highly alongside the rewarding impacts. Responding to items in this area, peers reported that they were now more likely to speak up when students with disabilities were bullied or when others use disparaging language about disability. It is also noteworthy that peers felt their capacity and commitment to advocate for others improved as a result of their involvement in a PMI. For students with severe disabilities who are at heightened risk of encountering negative attitudes or injurious actions (Tipton-Fisler et al., 2018), such changes in commitments are promising. However, the extent to which these improvements translate into actual behavior warrants further examination. This impact factor is an example of an area in which combining teacher observations with peer ratings could provide a richer understanding of the day-to-day differences resulting from PMI experiences. Researchers who evaluate PMI could ask teachers and other school staff to informally note observed changes in peer behavior or demonstrated instances of advocacy related to language use, bullying, or other instances of exclusion. Documenting concurrent behavioral changes in this—or any of the other six impact areas—could help enhance the concurrent validity of the PMIS:P and strengthen claims regarding the impact of PMIs.

Limitations and Future Research

Several limitations to this study should be addressed in future research. First, we are unable to determine the degree to which our sample is representative of all peers who are involved in PMIs. There is no existing list of schools in which PMIs are being implemented, nor are the names of participating peers publicly available. Therefore, we relied on program leaders and school contacts to distribute study invitations on our behalf. We estimate that our survey was sent to around 5,000 parents/peers. However, we are unable to confirm how many parents and peers ultimately received our study invitation, which precludes calculating an exact response rate. To assess the degree to which the reported peer responses are generalizable, this information is essential. Future studies should focus on specific PMI programs (e.g., a district's peer partner program, a statewide Best Buddies program, a college's peer mentoring program) and strive to secure high participation rates from a defined sample. Future studies should also strive to include a more diverse peer sample with regard to peer demographics. Although the high proportion of students who were female and White is consistent with demographics presented in prior reviews (e.g., Schaefer et al., 2016; Travers & Carter, 2022), it will be important to understand how racially, culturally, and linguistically diverse students might also benefit from involvement in these interventions.

Second, we only explored a limited set of variables that could be associated with the ways in which peers are impacted. Additional factors, however, may also have salience. For example, we did not ask whether peers supported any students who engaged in challenging behavior. It may be that such experiences are accompanied by more negative impacts (e.g., stress, fear) while also introducing more rewarding impacts (e.g., knowing one made a difference, feeling good about helping someone succeed). Likewise, we did not ask about whether peers received any remuneration in the form of course credit (at any level) or payment (at the postsecondary level). This potential benefit was raised by some college students in a review by Carter and McCabe (2021), yet it is unclear how the introduction of remuneration may influence whether students with and without disabilities develop new friendships or spend time together outside of school (social impact). Future research should explore these and other variables that may shape the outcomes for peers.

Third, the length of time between when peers participated in a PMI and when they completed the PMIS:P was not consistent across participants. Because of variations in how the COVID-19 pandemic affected schools in Fall 2020, some peers were involved in PMIs in person while others had shifted to a virtual

approach. As a result, some peers completed the PMIS:P while thinking about their current PMI experiences, while others had to reflect back on their in-person experiences during the prior school year. Future researchers can address this timing issue by distributing the PMIS:P at the same time to all participants. However, this limitation also raises an intriguing question: When should the impact on peers be examined? Most prior studies have distributed surveys to peers at the immediate end of their experience (i.e., the conclusion of the semester or school year; see review by Travers & Carter, 2021). However, it is unclear whether such information should be captured right in the midst of the experience, at the end, or sometime later after more time has passed. It may be valuable to administer the PMIS:P at multiple time points to gauge whether such timing makes a difference.

Fourth, the issue of social desirability is always a concern within studies that rely on self-report. Peers may have been prone to provide a more positive perspective on their experiences than was warranted. However, we took several steps to mitigate this concern. We encouraged peers to respond honestly. We provided space for peers to describe any negative impacts. And we emphasized that all responses were anonymous and could not be shared back with anyone at school or home. Moreover, numerous other studies have also affirmed this positive portrait of PMI experiences (see Travers & Carter, 2021). Future studies could triangulate these findings by also asking teachers or parents to share their perspectives on the outcomes of peers.

Fifth, we required peers to respond to each item on the PMIS:P. Although this eliminated the limitation of missing data, it may have introduced different issues. For example, research suggests requiring answers to all survey questions could inadvertently lead to fewer overall survey responses or occasionally lead to unreflective or dishonest responses (Décieux et al., 2015). However, it is also true that the more someone cares about the survey, the more time and effort they will put into completing it. Because no peer was required to take the survey and they could stop at any time with no penalty, we can conclude that all peers who participated fully were interested in providing their feedback and were more likely to be thoughtful in their responses.

Sixth, the percentage of exact match agreements on each of the PMIS:P items was low. This is not surprising given the nature of indirect survey measures addressing subjective topics. Moreover, given the high percentage of broad match agreements (i.e., peers agreed with an item at both time points or disagreed with an item at both time points), we are confident in our findings of the positive effects of PMI on peers. Future studies should continue to evaluate the reliability of the PMIS:P to ensure that the results of the measure are interpreted appropriately.

Seventh, we did not conduct a power analysis despite conducting multiple analyses. However, power analyses are not typically conducted when using nonparametric tests. As well, the Mann–Whitney *U* test can be applied on small samples (5 to 20) with increases in power as the sample size increases (Nachar, 2008). Given our sample of 277 participants, we are confident in our findings.

Implications for Practice

This study has several implications for practice. First, these findings could be used to advocate for more widespread adoption of PMIs within middle school, high school, and colleges that serve students with IDD. Although the effectiveness of these interventions for students with severe disabilities are well-established, general educators and school leaders may still be reluctant to adopt these approaches if they are uncertain of whether and how peers without disabilities might be impacted. Special educators should emphasize the reciprocal benefits of PMIs whenever they are introduced to a school.

Second, PMIs could be considered a promising avenue for actively promoting growth and gains for peers without disabilities. PMIs are typically selected as a way of promoting social and academic outcomes for specific students with severe disabilities. Yet, they could also be adopted as a way of helping specific peers develop new relationships, feel more included, learn new skills (e.g., problem-solving, leadership, communication), and build their self-worth. Indeed, a growing number of states have already established standards for social-emotional learning or have incorporated social-emotional skills into their academic content standards (Dusenbury et al., 2015). For peers who are themselves struggling in any of the areas identified on the PMIS:P, involvement in a PMI could be an additional way to support their growth.

Third, educators who coordinate or facilitate PMIs in their schools should be intentional about examining the ways in which participating peers are benefiting from their ongoing experiences. The PMIS:P comprises a practical way of capturing this impact with a reliable and valid tool. The tool could be distributed to peers during or after the PMI experience, analyzed to identify common areas of impact, and used to help inform PMI revisions. The measure could be supplemented with individual interviews and/or accompanied by reflections from educators and parents. However, care should be taken to explain the reasons for asking for this information and to assure peers that what they share will not be communicated to others or used in punitive ways. Indeed, it may also be useful to have peers complete the PMIS:P anonymously.

Conclusion

Understanding how peers benefit from spending time with their schoolmates with severe disabilities has been a long-standing interest in the field (e.g., Helmstetter et al., 1994; Peck et al., 1990). We asked secondary and postsecondary peers to indicate how they felt they were impacted by their PMI experiences supporting students with IDD. The majority of peers indicated they were positively impacted in a range of ways. Moreover, the ways in which peers reported they were impacted may be related to several peer- and intervention-related factors. This study sheds light on the need to assess outcomes for peers in addition to the students who they support to highlight the reciprocity of these interventions. We appeal to future studies to extend this line of inquiry to better understand the factors that are related to differences in outcomes for peers. We also encourage educators to continue to advocate for the use of these interventions given the evidence of the numerous benefits for all participating students.

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