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# The Reciprocity of Peer-Mediated Interventions: Examining Outcomes for Peers

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## ABSTRACT

Peer-mediated interventions are an evidence-based practice for enhancing the social and learning outcomes of students with autism and other developmental disabilities. However, little is known about the peers who participate in these interventions or the ways they are impacted through their involvement. In this pilot study, we examined changes in academic and behavioral outcomes of 204 peers involved in a semester-long peer partners program at eight public high schools. Although the majority of peer partners were female, these volunteers varied widely in their academic and behavioral profiles the semester prior to their involvement in *Peer to Peer*. Overall, peer partners experienced increases in their overall GPAs ($d = 0.34$), and daily attendance ($d = 0.56$) after one semester of involvement. Modest decreases in behavioral referrals and suspensions were evident only among the subset of peer partners who previously had such infractions. After two semesters of involvement, improvements were evident in all four areas for the subset of students for whom these data were available: GPA ($d = 0.42$), absences ($d = 0.26$), behavior referrals ($d = 0.46$) and suspensions ($d = 0.37$). We discuss the importance of reciprocity within these widely advocated interventions and offer recommendations for research and practice.

## IMPACT STATEMENT

This study describes the characteristics and reciprocity of outcomes for high school peers who participate as peer partners alongside students with autism or other developmental disabilities. The majority of peer partners in this study experienced positive academic and behavioral outcomes when participating in these programs, with improved GPAs, increased attendance, decreased behavior referrals and decreased suspensions during the semester they provided peer support. This suggests that program coordinators, school psychologists, and other school staff should actively seek to involve diverse peer partners in their programs by including students with academic or behavioral challenges, rather than only high-achieving students. Peer-mediated interventions are not only beneficial for students with disabilities, but involvement can also impact outcomes for at-risk peers.

## THE RECIPROCITY OF PEER-MEDIATED INTERVENTIONS

### Examining Outcomes for Peers

Social and learning opportunities abound throughout high school. Each year, students take an array of challenging courses (e.g., core academics, electives, related arts), they participate in interesting extracurricular clubs and programs (e.g., academic, athletic, cultural, interest-based), they pursue volunteer or service-learning experiences, and they attend an assortment of school-sponsored events (e.g., field trips, pep rallies, sporting events, fine arts performances). Opportunities to develop and deepen relationships with fellow students

cut across all of these experiences—in classrooms, cafeterias, courtyards, and so many other campus settings. Yet many secondary students with autism still find themselves on the peripheries of these formative and influential experiences (Krieger et al., 2018). For example, students with autism—particularly those who also have a cognitive impairment—have limited enrollment in general education classes during secondary school (Carter, 2018). Participation in extracurricular activities (Agran et al., 2020) or service-learning experiences (Bonati & Dymond, 2019) can be elusive. Further, the social interactions and peer relationships so central to school success and student well-being can be scarce (Hochman et al., 2015; Lipscomb et al., 2017).

## Peer-Mediated Interventions

Peer-mediated interventions are research-based practices for expanding the academic and social participation of adolescents with autism and other developmental disabilities (Carter, 2021; Odom, 2019). Although a variety of different peer-mediated approaches have been developed and evaluated, each actively involves peers in providing ongoing academic, social, and/or behavioral supports to their schoolmates with disabilities under the guidance of educators. For example, peers might assist their classmate with autism within inclusive general education classes (peer support arrangements), join in a social group formed around a schoolmate with autism during lunch or within school clubs (peer network interventions), teach new skills to students in special education classrooms (peer tutoring), or participate in schoolwide initiatives to promote awareness and inclusion across the school day (peer partners programs). The flexibility and feasibility of these school-based interventions makes them especially attractive to educators striving to expand the educational inclusion of students with autism (Carter, 2021).

## Impact of Peer-Mediated Interventions on Students With Disabilities

Dozens of studies confirm that peer-mediated interventions can substantially enhance the learning and social outcomes of secondary students with autism and other developmental disabilities. Academically, studies demonstrate that students with disabilities who receive assistance from their peers tend to be more engaged in class, experience greater access to the curriculum, make more progress on their individualized learning goals, and improve their grades (e.g., Brock & Huber, 2017; Kuntz & Carter, 2019). Socially, research indicates that students with disabilities who receive ongoing support from their peers have substantially more social interactions, improve their social and communication skills, develop more friendships, and experience greater involvement in the life of their school (e.g., Carter, 2021; Watkins et al., 2017). The accumulation of studies demonstrating the overwhelmingly positive outcomes of peer-mediated interventions for students with autism and other developmental disabilities has led to their identification as an evidence-based practice (Steinbrenner et al., 2020).

## Impact of Peer-Mediated Interventions on Peers Without Disabilities

Far less is known about ways in which participating peers are themselves impacted by their involvement in supporting and spending time with their schoolmates with disabilities.

The extent to which peer-mediated interventions are mutually beneficial for *all* participating students is an important and enduring question. Indeed, educators who are considering whether to adopt this practice in their school may first want to know whether participating peers are likely to be helped or hindered by committing time to these experiences. Two systematic literature reviews suggest that peers can actually benefit personally from their ongoing and direct involvement. First, Schaefer et al. (2016) reviewed 53 studies of peer-mediated interventions implemented with elementary *and* secondary students with intellectual disability. Many of these studies documented increases in the quantity or quality of peer's social interactions as students worked together; a smaller subset of nine studies found that peers also benefited academically. For example, academically high-achieving peers tended to maintain their already high grades, while students with moderate or low grades (B or below) increased their engagement and grades when participating in peer support arrangements. More recently, Travers and Carter (2022) reviewed 98 studies examining peer-mediated interventions implemented with secondary students with autism, intellectual disability, or multiple disabilities. Across studies, peers reported personal impacts in nine primary areas: social outcomes, changes in views toward disability, future intentions related to disability, academic engagement, increased knowledge about disability, development of personal qualities (e.g., empathy, kindness, compassion), skill development, enhanced self-perceptions, and personal enjoyment. For example, 21 of these studies offered some indication that peers benefited academically from their experience—primarily through increased academic engagement or improved grades. However, most studies relied on peer self-report provided at the end of their experience, rather than official records.

Overall, these reviews highlight the potential reciprocity of these widely advocated interventions. Yet, most studies examined in these literature reviews focused on the subjective experiences of peers (i.e., their self-perceptions of personal impact), involved fairly small samples of peers (e.g., single-case interventions or qualitative studies), incorporated a narrow indicator related to impact (e.g., a single survey question), or collected data at only one point in time (e.g., an end-of-semester survey). Moreover, none of the studies have examined the areas of attendance, suspensions, and expulsions—each of which is strongly associated with school success and graduation outcomes. The paucity of longitudinal examinations of peer impact have left the field without a clear understanding of how the academic and behavioral outcomes of peers might change over time as a result of their peer-mediated experiences. Knowing more about whether and how peers benefit from their involvement could help bolster calls

to expand the use of peer-mediated interventions in secondary schools (Carter, 2018).

Likewise, few studies have sought to characterize the peers who volunteer for peer-mediated interventions. The average high school enrolls approximately 800 students, with some schools exceeding 2,000-3,000 students (National Center for Education Statistics, 2019). But only a subset of these students chooses to participate formally in their school's peer-mediated programs. Knowing more about who voluntarily participates could provide valuable insights into the reach of these programs within a given school and the students who are being impacted. Demographics aggregated across studies reviewed by both Schaefer et al. (2016) and Travers and Carter (2022) indicate that most participating peers have been female and White. However, the academic and behavioral profiles of these peers have not been explored. Implementation guidelines for some peer-mediated interventions explicitly encourage educators to involve a diversity of peers from their school, including students who may themselves struggle academically, experience behavioral challenges, or have inconsistent attendance (e.g., Carter, 2021; Collins & Hawkins, 2021). Indeed, peer-mediated interventions are sometimes advocated as a potential avenue for addressing the academic and behavioral outcomes of at-risk students (Cushing & Kennedy, 1997; Dunn et al., 2017).

### The Context for the Current Study

The current study examines the portrait of peers who participated in their high school's *Peer to Peer* program, as well as the academic and behavioral outcomes they experienced after one and two semesters of involvement. *Peer to Peer* is a schoolwide peer-mediated program that involves peers in supporting their schoolmates with autism and other developmental disabilities socially and/or academically across the school day (Ziegler et al., 2020). Like other schoolwide programs implemented at the high school level (e.g., *Peer Buddy Program*, Hughes & Carter, 2008; *Kentucky Peer Tutoring*, Longwill & Kleinert, 1998 ), *Peer to Peer* provides an overall structure through which multiple peers are invited, equipped, and connected with students with disabilities at various times and settings throughout each school day. Among the more than 700 elementary, middle, and high schools that currently offer *Peer to Peer* in Michigan, nearly 18,000 peers support nearly 5,000 schoolmates with disabilities across classrooms, cafeterias, clubs, and other school settings (see Table 1).

The purpose of this pilot study was to examine the characteristics of participating peers, as well as the academic (i.e., GPA) and behavioral (i.e., attendance, behavioral referrals, and suspensions) changes they experience while involved in *Peer to Peer*. We examined the following research questions:

RQ1: What are the profiles of peers who volunteer for *Peer to Peer*?

RQ2: What academic and behavioral changes are evident after one semester of *Peer to Peer*?

RQ2: What academic and behavioral changes are evident after two semesters of *Peer to Peer*?

RQ4: What factors are associated with improvements in academic and behavioral outcomes?

## METHOD

### Peer to Peer Program

*Peer to Peer* is a schoolwide peer-mediated program in which peers actively support their schoolmates with autism and other developmental disabilities (e.g.,

**Table 1.** Roles of Peer Partners in School Activities

| Settings | Peer Roles |
|---|---|
| General Education Classes (Core and Non-Core Classes) | Modeling academic skills and assisting with academic work<br>Modeling appropriate behavior and engagement<br>Participating in small-group peer work and activities<br>Encouraging the student to ask questions or contribute responses<br>Having conversations about course content<br>Participating in social interaction during free time<br>Encouraging students to use communication devices<br>Promoting social interactions with others |
| Resource Room Or Special Education Room Support | Participating in the resource room/special education setting<br>Modeling appropriate social and academic behaviors<br>Participating in games and activities organized by the classroom teacher |
| Homeroom, Lunch, Community Trips, Hallway Transition, Assemblies | Modeling appropriate student behavior<br>Eating lunch together in the cafeteria<br>Participating in games/activities organized by the *Peer to Peer* team<br>Participating in social conversation, discussing topics of interest<br>Collaborating during activities and projects |
| Extracurricular Activities (After School) | Attending school sporting events with peer partners<br>Attending after-school clubs with peer partners<br>Attending dances with peer partners<br>Attending senior activities with peer partners |

intellectual disability, multiple disabilities) socially and/or academically throughout the school day (Matthews et al., in press). Core components include: (a) recruiting multiple students who voluntarily agree to serve as "peer partners"; (b) equipping peer partners with relevant skills, knowledge, and support strategies through initial and ongoing trainings; (c) matching peer partners with students with developmental disabilities who would enjoy and benefit from their support; (d) creating regular opportunities for students to spend time together in classrooms, cafeterias, extracurricular activities, and other school-sponsored events; (e) engaging peer partners in group problem solving and advocacy through "case conferences"; and (f) monitoring the program's implementation and impact.

In this model, each school has a *Peer to Peer* program coordinator (usually a special educator) who is responsible for recruiting peers, providing training for peers and staff, managing schedules for peers and students with disabilities, arranging the problem-solving meetings led by staff and peers, and maintaining communication with building principals. The coordinator is supported by a core team of 3–5 school professionals who help to secure support for the program; publicize it to students, staff, and families; brainstorm logistical issues and challenges; and reflect on the program's implementation and impact. Our technical assistance project in the state of Michigan provides support to each school related to planning, implementing, and evaluating their *Peer to Peer* program. School staff applying for support must assemble a core team and attend an initial training. In addition, schools can also access informal support regionally or from district consultants who lead their own *Peer to Peer* programs.

Step-by-step procedures for establishing a program are described in Ziegler et al. (2020). Implementation manuals, fidelity measures, and other supportive materials are all available freely through the START project website (https://www.gvsu.edu/autismcenter). Although these materials delineate key components related to staff training, program development, and program implementation, the program can be tailored based on the needs and culture of a particular school or district. For example, schools make their own site-specific decisions about the scope and scale of the program, the students and peers they involve, the activities students do together, the training and support they offer, and the staffing and resources they allocate.

## Participating Schools

Although *Peer to Peer* can be implemented in either elementary or secondary programs, our pilot study focused on eight high schools. We selected these eight high schools for this pilot study because they had been operating their programs for several years, they served a diversity of communities, and they were willing to carry out data collection. Each school's program varied—based, in part, on school enrollment—in the number of participating peers and students with disabilities. The eight high school programs in this study supported an average of 5 students with autism (range, 1–9 across schools) and involved an average of 26 peer partners (range, 9–56 across schools). The focus of this study was on the 204 peer partners who attended these schools. These schools ranged in size from 439 to 1818 students ($M = 921$ students). Four were in urban areas, two were in suburban areas, and two were in rural areas. Average race/ethnicity of students across schools ranged from 0.0% to 95.1% African American ($M = 25.6\%$), 0.0% to 31.9% American Indian ($M = 4.2\%$), 0.0% to 11.6% Asian American ($M = 2.4\%$), 0.5% to 95.5% European American ($M = 61.1\%$), 1.0% to 17.4% Hispanic/Latino/a ($M = 5.9\%$), 0.0% to 0.8% Native Hawaiian or Other Pacific Islander ($M = 0.2\%$), and 0.0% to 1.3% multiple races ($M = 0.5\%$). The percentage of students eligible for free or reduced-price meals ranged from 20.0% to 75.0% ($M = 47.0\%$). The percentage of students receiving special education services ranged from 1.5% to 24.5% ($M = 12.4\%$). Demographics for individual schools are displayed in Table 2.

Although each program was run slightly differently to match the needs and resources of the individual school, all had certain core components. Peer partners were recruited through a variety of avenues (e.g., school announcements, flyers, display tables, school counselors, teacher invitation), were oriented to their roles by participating staff, and provided training relevant to their roles (e.g., disability etiquette, confidentiality, basic support and instructional strategies, approaches for providing feedback). Across schools, the specific responsibilities of peer partners varied depending on multiple factors, including the needs and preferences of the students whom they supported, the settings and activities during which students worked together, and the capabilities and confidence of the peers. The varied roles of peer partners are outlined in Table 1.

All participating high schools adopted a state-approved credit course that provided students with and without disabilities consistent times each day to spend together. During the peer's elective *Peer to Peer* course period, they attended class with the student with autism. However, the ways in which students and their peers were matched together varied within each school based on the settings in which students spent time and the particular needs of each student with autism. In general, peer partners usually worked with the same students with autism daily, for one class period, throughout the entire semester. Moreover,

**Table 2.** Total Student Demographics of Participating High Schools

| Variable | High schools | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| Total enrollment | 439 | 1818 | 1099 | 889 | 900 | 593 | 1012 | 621 |
| Race/ethnicity | | | | | | | | |
| African American | 0 (0.0) | 27 (1.5) | 10 (0.9) | 43 (4.8) | 11 (1.2) | 564 (95.1) | 716 (70.8) | 188 (30.3) |
| American Indian | 4 (0.9) | 10 (0.6) | 4 (0.4) | 2 (0.2) | 287 (31.9) | 0 (0.0) | 0 (0.0) | 0 (0.0) |
| Asian American | 1 (0.2) | 34 (1.9) | 4 (0.4) | 31 (3.5) | 15 (1.7) | 0 (0.0) | 3 (0.3) | 72 (11.6) |
| White | 409 (93.2) | 1649 (90.7) | 1050 (95.5) | 761 (85.6) | 575 (63.9) | 3 (0.5) | 116 (11.5) | 299 (48.1) |
| Hispanic/Latinx | 22 (5.0) | 73 (4.0) | 25 (2.3) | 39 (4.4) | 9 (1.0) | 21 (3.5) | 176 (17.4) | 61 (9.8) |
| Native Hawaiian or Other Pacific Islander | 0 (0.0) | 2 (0.1) | 1 (0.1) | 1 (0.1) | 1 (0.1) | 5 (0.8) | 0 (0.0) | 0 (0.0) |
| Multiple races | 3 (0.7) | 23 (1.3) | 5 (0.5) | 12 (0.5) | 2 (0.2) | 0 (0.0) | 1 (0.1) | 1 (0.2) |
| Percent eligible for free or reduced-price meals | 26 | 30 | 75 | 20 | 36 | 56[a] | 56[a] | 56[a] |
| Percent eligible for special education services | 15.9 | 9.9 | 11.0 | 12.0 | 10.6 | 24.5 | 13.9 | 1.5 |

[a]Individual school data are not available; the average percentage for the county is provided instead.

multiple peer partners ($M = 5$) generally worked with the same student across a given school day. Although students with autism did not always have peer partners in each class period throughout the day, during the classes where they did have peer support, they usually had more than one partner. For example, during second hour, the student with autism might attend history with two peer partners. During an extracurricular activity period, there might be four peer partners and two students with autism participating with other students in the yearbook club, during fifth-hour P.E. class there might again be two peer partners and three students with disabilities participating along with their high school classmates in physical education. By assigning multiple peers to a class period, peer partner absences, whether due to illness or behavioral concerns, did not result in missing supports and opportunities. Peer partners were also encouraged to participate in other school activities with their peers, such as during lunch, community trips, hallway transitions, or assemblies. Sometimes these arrangements were structured aspects of the program, but sometimes they were more informal. This flexibility in how and when students were paired allowed schools to tailor the program to their specific context and students.

The elective course incorporated curricular and experiential elements designed to increase the knowledge, attitudes, and skills of peer partners. Early in the semester, peer partners received training and information about autism to support their understanding and scaffold their involvement in the program. Throughout the semester, they completed assignments to extend their learning about students with disabilities and participated in monthly group meetings to celebrate successes and problem-solve any challenging situations. School staff used a variety of methods to support student learning. Some content was delivered didactically, but most occurred during scheduled problem-solving meetings, was provided in the context of

natural opportunities in the classroom with their peer partner, or occurred as part of asynchronous online learning activities. Peer partners sometimes completed AFIRM modules (https://afirm.fpg.unc.edu/afirm-modules), responded to journal prompts, or participated in projects to demonstrate their learning. However, their most important roles involved active, daily social engagement with their peer partners with autism in everyday school experiences.

Peer partners offering support within the general education classroom shared materials, modeled appropriate work on an assignment, collaborated on group projects, encouraged the student's contributions, or conversed about their work. Peer partners offering support within an extracurricular club discussed topics of shared interest, offered emotional support, shared jokes and conversation, and collaborated on activities. Likewise, peer partners and students with autism sometimes ate lunch together, met up at lockers, hung out in the courtyard, or shared seats on the bus ride home. *Peer to Peer* core teams also identified social activities that could expand friendships between peer partners. They organized games, community trips, and opportunities to coparticipate in sports, parties, and banquets. It was through these shared experiences and supports that students with disabilities gained access to opportunities that built new skills and fostered new relationships.

## Measures

We collected demographic information for peer partners, including sex, grade level, race/ethnicity, disability status (and type), and the label that best characterized the student: honors, general education, alternate education (i.e., students who were considered at-risk or required multi-tiered support), or students with disabilities (i.e., received special education services with an IEP or had a 504 plan).

In addition, we collected information about their absences, grade point average (GPA), behavioral referrals, and suspensions across three time points: (a) the semester prior to their involvement in *Peer to Peer*, (b) their first semester of involvement in *Peer to Peer*, and (c) their second semester of involvement in *Peer to Peer*. Information on this third time point was only available for 80 students from three high schools. This information was obtained from the *Peer to Peer* coordinator in each school and through the school's online data tracking systems. Semesters lasted 90 days. In addition, we asked each coordinator to provide subjective ratings of each peer partner in five different areas: professionalism, responsibility, attendance, their support related to academics, and their support related to socialization and independence. Ratings were provided at the end of the semester using a 5-point, Likert-type scale ranging from 1 = not at all successful/effective to 5 = extremely successful/effective. In most cases, the *Peer to Peer* coordinator was the primary teacher of record for the *Peer to Peer* program in the school; thus, they monitored attendance, graded assignments, reviewed journal submissions, supported case conferences, and occasionally observed peer partners in classes. If the coordinator did not have regular contact with the peer partners, we asked them to obtain these ratings from the supervising teacher, case conference coordinator, or another individual who had first-hand knowledge of the peer partner's participation in the program. All procedures were approved by the university's Institutional Review Board.

## Data Analysis

To address RQ1, we used descriptive statistics to summarize the demographic, academic, and behavioral characteristics of peers the semester before they volunteered for *Peer to Peer*. To address RQ2 and RQ3, we used paired samples *t* tests to compare GPA, absences, behavioral referrals, detentions, and suspensions between the semester before enrolling in *Peer to Peer* and the first (RQ2) or second semester (RQ3) semester of serving as a peer partner. We examined the magnitude of differences by calculating Cohen's *d*. We interpreted effect sizes using the guidelines outlined by Cohen (1988), in which .20 is considered small, .50 moderate, and .80 large. We defined chronic absence as missing 10% or more of the school year, or 9 days per semester (Sprick & Berg, 2019). Because the number of behavioral referrals and suspensions per semester are usually quite small or not experienced by most students, we also descriptively examined the numbers and percentages of students whose measures increased, decreased, or were unchanged across semesters. Missing data were limited for RQ2. However, RQ3 focuses only on a subset of 80 students from three high schools in which

two semesters of peer partner data were available. To address RQ4, we compared changes in each outcome based on student sex (i.e., female versus male), race/ethnicity (i.e., White versus African American), grade level (i.e., lower grades of 9/10 versus upper grades of 11/12), and GPA prior to joining *Peer to Peer* (i.e., 2.0 or less versus above 2.0). We used independent samples *t* tests and examined the magnitude of any differences by calculating Cohen's *d*.

## RESULTS

### What Are the Profiles of Peers Who Volunteer for Peer to Peer?

As shown in Table 3, the majority of peer partners was female (66.2%). Grade levels were skewed somewhat toward higher grade levels, with one third (34.3%) being seniors. This may be because students taking *Peer to Peer* for credit would have more room in their schedule later

**Table 3.** Peer Partner Demographics and Program Coordinator Ratings

| Variables | Frequency (%) | M (SD) |
|---|---|---|
| **Gender** | | |
| Male | 67 (32.8) | |
| Female | 135 (66.2) | |
| Not reported | 2 (1.0) | |
| **Grade** | | |
| Freshman | 22 (10.8) | |
| Sophomore | 49 (24.0) | |
| Junior | 60 (29.4) | |
| Senior | 70 (34.3) | |
| Not reported | 3 (1.5) | |
| **Race/ethnicity** | | |
| African American | 55 (27.0) | |
| Asian/Pacific islander | 3 (1.5) | |
| Hispanic/Latino | 3 (1.5) | |
| White | 136 (66.7) | |
| Other | 5 (2.5) | |
| Not reported | 2 (1.0) | |
| **Disabilities** | | |
| No disabilities | 118 (57.8) | |
| Learning disabilities | 16 (7.8) | |
| ADHD | 2 (1.0) | |
| Hearing impairment | 1 (0.5) | |
| Selective mutism | 1 (0.5) | |
| On a 504 Plan (disability not specified) | 4 (2.0) | |
| Not reported | 62 (30.4) | |
| **School program** | | |
| General education | 139 (68.1) | |
| Honors program | 34 (16.7) | |
| Special education | 14 (6.9) | |
| Alternate education | 9 (4.4) | |
| Not reported | 8 (3.9) | |
| **Program coordinator ratings of peer partners**[a] | | |
| Professionalism | | 4.12 (1.00) |
| Responsibility | | 4.15 (1.00) |
| Attendance | | 4.12 (1.16) |
| Supporting academics | | 4.04 (1.07) |
| Supporting socialization and independence | | 4.04 (1.12) |

[a]Ratings provided on a 5-point Likert-type scale from 1 = not at all successful/effective to 5 = extremely successful/effective.

in their programs. Consistent with the demographics of the schools they attended, most students were White (66.7%) or African American (27.0%). Among the peer partners for whom disability status was known, 11.8% had a disability.

The academic and behavioral portraits of these students during the semester just prior to their involvement provides insight into which peers were selected for the *Peer to Peer* program. The average GPA was 2.81 ($SD = 0.88$, range, 0.0 to 4.4). However, GPA also varied widely among students. 19.6% had below a 2.00, 11.3% had between 2.00-2.49, 19.1% had between 2.50-2.99, 21.6% had between 3.00-3.49, and 28.4% had a 3.50 or above (all on a 4-point scale). Average number of absences during this semester was 7.04 ($SD = 7.01$; range, 0 to 56.5). Overall attendance also varied widely among the students. Specifically, 8.3% had no absences, 38.4% missed less than 5 days, 22.2% missed between 5 and 9 days, and 30.8% missed 9 or more days (i.e., chronic absence). The average number of behavioral referrals during the semester was 0.50 ($SD = 1.21$; range, 0 to 8). Most students (74.4%) had no behavioral referrals. Among the remaining students, 14.3% had 1 referral, 6.9% had 2 referrals, and 4.5% had 3 or more referrals. The average number of suspensions during the semester was 0.14 ($SD = 0.26$; range, 0 to 8). Most students (87.7%) had no suspensions. Among the remaining students, 6.9% had 1 suspension, 3.0% had 2 suspensions, and 2.5% had 3 or more suspensions.

## What Changes Are Evident After One Semester of Peer to Peer?

Table 4 provides information related to the primary peer partner outcome variables for this study, including GPA, absences, behavior referrals and suspensions.

**GPA.** The average GPA increased significantly from 2.81 ($SD = 0.88$) the semester prior to being a peer partner to 2.95 ($SD = 0.87$) the first semester of being a peer partner, $t(203) = 4.85$, $p < .001$, $d = 0.34$, indicating a small effect. In this sample, 49.0% of students showed improvement in their GPAs during the semester they became a peer partner, while 22.5% showed a decrease in their GPA. Among the 98 students whose GPA was *higher* as a peer partner, 8 increased less than .10, 64 increased between .10 and .50, and 26 increased more than .50. Among the 46 students whose GPA was *lower* as a peer partner, seven decreased less than .10, 34 decreased between .10 and .50, and five decreased more than .50. No changes in GPA were found for the remaining 28.3% of students ($n = 60$).

**Absences.** The average number of total absences decreased significantly from 7.04 ($SD = 7.01$) the semester prior to being a peer partner to 4.03 ($SD = 4.35$) the first semester of being a peer partner, $t(197) = -7.91$, $p < .001$,

$d = 0.56$, indicating a moderate effect. In this sample, 66.2% of students had fewer absences during the semester they became a peer partner, while 21.2% had more absences as a peer partner. Among the 131 students who had *fewer* absences, 77 decreased less than 5 days, 39 decreased by 5-10 days, and 15 decreased by more than 10 days (see Figure 1). Among the 42 students who had *more* absences as a peer partner, 39 students increased by less than 5 days, three students increased by 5-10 days, and none increased by more than 10 days. No change in absences were recorded for the remaining 12.6% of students ($n = 25$).

**Behavioral referrals.** The average number of behavior referrals decreased from 0.50 ($SD = 1.21$) to 0.39 ($SD = 1.04$), but the difference was not significant and the effect was very small, $t(202) = -1.75$, $p = .082$, $d = 0.12$. In this sample, 16.7% of students had fewer behavior referrals during the semester they became a peer partner, while 8.9% had more behavior referrals as a peer partner. Nearly three quarters of students (74.0%, $n = 151$) had no changes in the number of behavioral referrals across semesters (see Figure 1). Among the 34 students who had *fewer* behavioral referrals, 23 students decreased by 1, nine students decreased by 2, one student decreased by 5, and one student decreased by 6. Among the 18 students who had *more* behavioral referrals, nine students increased by 1, seven students increased by 2, and one student increased by 3.

**Suspensions.** The average number of suspensions decreased from 0.25 ($SD = 0.94$) to 0.22 ($SD = 0.79$), but the difference was not significant and the effect was very small, $t(201) = -.733$, $p = .464$, $d = 0.09$. In this sample, 7.4% of students had fewer suspensions during the semester they became a peer partner and 5.0% of students had more suspensions. Most students (86.8%, $n = 177$) had no changes in the number of suspensions across semesters (see Figure 1). Among the 15 students who had *fewer* suspensions, 12 students decreased by 1, one student decreased by 2, one student decreased by 3, and one student decreased by 6. Among the 10 students who had *more* suspensions, five students increased by 1, four students increased by 2, and one student increased by 3.

## What Changes Are Evident After Two Semesters of Peer to Peer?

The sample for these additional analyses is limited to 80 students from three schools. These data are provided in Table 4.
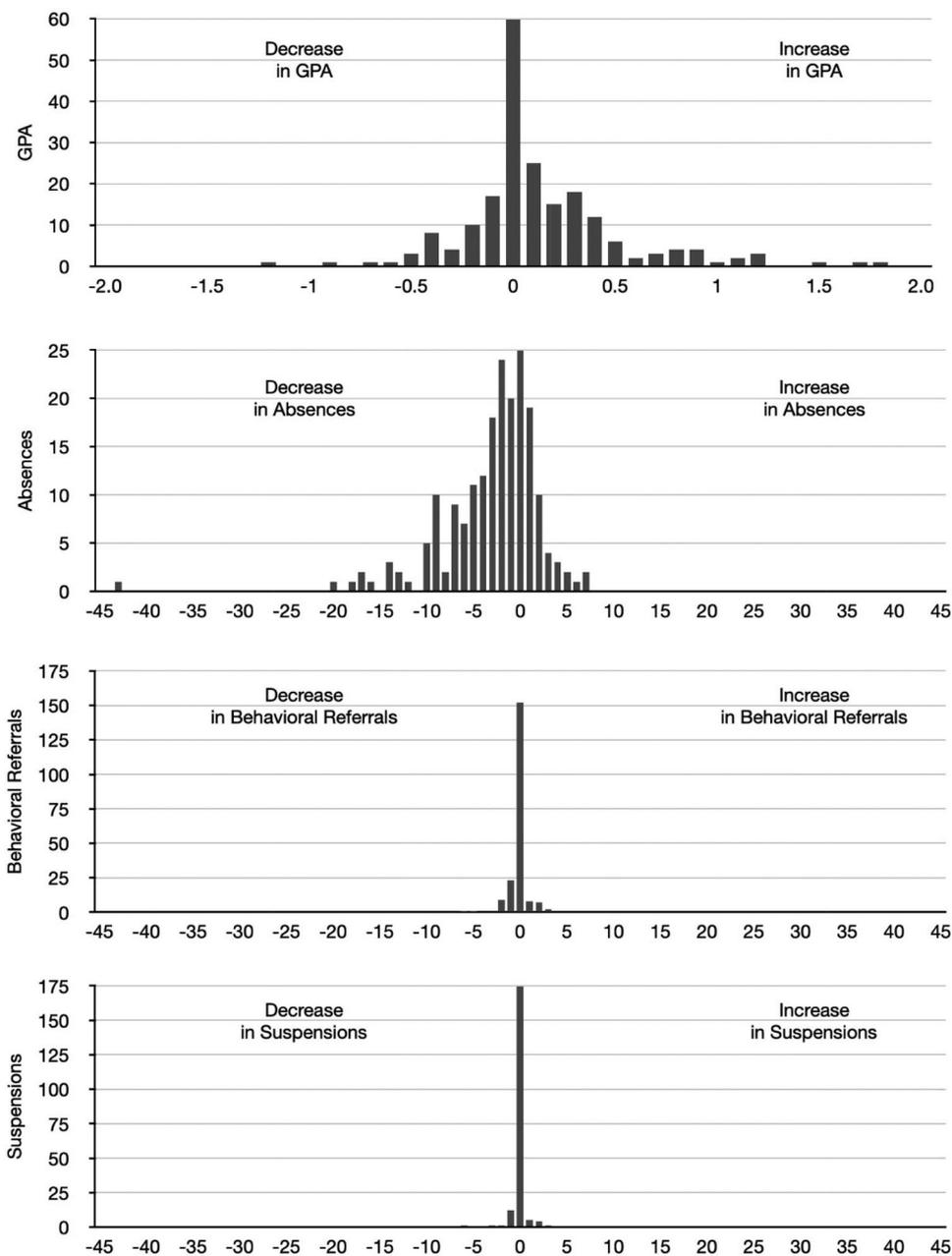
**GPA.** The average GPA increased significantly from 2.52 ($SD = 0.94$) the semester prior to being a peer partner to 2.68 ($SD = 0.82$) the second semester of being a peer partner, $t(79) = 3.76$, $p < .001$, $d = 0.42$, indicating a small to moderate effect. In this sample, 65.0% of students had a higher GPA during the second semester of

**Table 4.** Peer Partner Outcome Variables

| Variable | Peer partners from all schools | | | Peer partners from three schools[a] | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Semester prior to *Peer to Peer* | First semester of *Peer to Peer* | Effect size | Semester prior to *Peer to Peer* | Second semester of *Peer to Peer* | Effect size |
| GPA | 2.81 (0.88) | 2.95 (0.87) | 0.34 | 2.52 (0.82) | 2.68 (0.82) | 0.42 |
| Absences | 7.04 (7.01) | 4.03 (4.35) | 0.56 | 9.56 (8.42) | 7.34 (6.28) | 0.26 |
| Behavioral referrals | 0.50 (1.21) | 0.39 (1.04) | 0.12 | 0.69 (1.26) | 0.08 (0.31) | 0.46 |
| Suspensions | 0.25 (0.94) | 0.22 (0.79) | 0.09 | 0.48 (1.25) | 0.01 (0.11) | 0.37 |

[a]The sample for these analyses is limited to 80 students from three schools.

**Figure 1.** Histograms Depicting Changes in GPA, Absences, Behavioral Referrals, and Suspensions

being a peer partner and 23.8% of students had a lower GPA. Among the 52 students whose GPA was *higher* as a peer partner, 46 increased between .10 and .50, and six increased more than .50. Among the 19 students whose GPA was *lower* as a peer partner, 18 decreased less than .10, and one decreased more than .50. No changes in GPA were found for the remaining 11.3% of students ($n = 9$).

**Absences.** The average number of total absences decreased significantly from 9.56 ($SD = 8.42$) the semester prior to being a peer partner to 7.34 ($SD = 6.28$) the second semester of being a peer partner, $t(76) = -2.25$, $p = .027$, $d = 0.26$, indicating a small effect. In this sample, 61.0% of students had fewer absences during the second semester of being a peer partner and 37.7% of students had more absences. Among the 47 students who had *fewer* absences, 29 decreased less than 5 days, 14 decreased by 5-10 days, and 4 decreased by more than 10 days. Among the 29 students who had *more* absences as a peer partner, 23 students increased by less than 5 days, four students increased by 5-10 days, and two increased by more than 10 days. No change in absences were recorded for the one remaining student.

**Behavioral referrals.** The average number of behavior referrals decreased significantly from 0.69 ($SD = 1.26$) the semester prior to being a peer partner to 0.08 ($SD = 0.31$) the second semester of being a peer partner, $t(79) = -4.13$, $p < .001$, $d = 0.46$, indicating a moderate effect. In this sample, 40.0% of students had fewer behavior referrals during the second semester of being a peer partner and 5.1% of students had more behavior referrals. More than half of students (55.0%, $n = 44$) had no changes in the number of behavioral referrals. Among the 32 students who had *fewer* behavioral referrals, 21 decreased by 1, eight students decreased by 2, one student decreased by 3, and two students decreased by 5 or more. Among the 4 students who had *more* behavioral referrals, three students increased by 1 and one student increased by 2.

**Suspensions.** The average number of suspensions decreased significantly from 0.48 ($SD = 1.25$) the semester prior to being a peer partner to 0.01 ($SD = 0.11$) the second semester of being a peer partner, $t(79) = -4.13$, $p = .002$, $d = 0.37$, indicating a small effect size. In this sample, 22.5% of students had fewer suspensions during the second semester of being a peer partner and only 1 student had more suspensions. More than three quarters of students (76.3%, $n = 61$) had no changes in the number of suspensions. Among the 18 students who had *fewer* suspensions, nine students decreased by 1, six students decreased by 2, one student decreased by 3, and two students decreased by 5 or more. For the one student who had *more* suspensions, the increase was just 1.

## What Factors Are Associated With Improvements in Academic and Behavioral Outcomes?

We examined whether any differences in changes over one semester were apparent based on the gender, race, or grade level of participating peers.

**Gender.** We found no differences between girls and boys with regard to changes in GPA ($p = .448$), attendance ($p = .130$), behavior referrals ($p = .162$), or suspensions ($p = .262$).

**Race.** We found no differences between students who were White and students of other races with regard to changes in behavioral referrals ($p = .898$) or suspensions ($p = .694$). The increase in GPA was significantly larger for White students ($M = 0.18$; $SD = 0.45$) than for students of other races ($M = 0.04$; $SD = 0.26$), $t(200) = 2.36$, $p = .019$, $d = 0.35$. The decrease in absences was significantly larger for students of other races ($M = -4.50$; $SD = 7.56$) than for White students ($M = -2.34$; $SD = 3.84$), $t(194) = 2.65$, $p = .009$, $d = -0.41$.

**Grade level.** We found no differences between younger students (grades 9 and 10) and older students (grades 11 and 12) with regard to changes in GPA ($p = .158$), attendance ($p = .445$), behavior referrals ($p = .976$), or suspensions ($p = .586$).

**GPA.** We found no differences between students with low pre-program GPAs (2.0 or less) and higher pre-program GPAs (above 2.0) with regard to changes in behavioral referrals ($p = .742$) or suspensions ($p = .881$). The decrease in absences was significantly larger for students with low pre-program GPAs ($M = -5.15$; $SD = 8.60$) than for students with higher pre-program GPAs ($M = -2.47$; $SD = 4.02$), $t(196) = -2.88$, $p = .004$, $d = -0.51$. The increase in GPA was significantly larger for students with low pre-program GPAs ($M = 0.30$; $SD = 0.56$) than for students with higher pre-program GPAs ($M = 0.09$; $SD = 0.33$), $t(202) = 3.03$, $p = .003$, $d = 0.53$.

## DISCUSSION

Peers can play a powerful role in promoting the inclusion of adolescents with autism and other developmental disabilities. Although peer-mediated interventions have been studied extensively, the lens of this research has focused predominantly on the experiences and outcomes of participating students with disabilities. The current study shifts this attention toward the peers who are involved in providing ongoing support. Our findings provide several new insights about critical—but often overlooked – outcomes of this intervention on peer partners.

First, a wide variety of peers assisted in advancing the educational and social outcomes of high school students with developmental disabilities. The predominance of girls

among peer partners is consistent with prior reviews and with most individual peer-mediated studies (e.g., Carter, 2021; Schaefer et al., 2016). It is unclear whether this pattern reflects higher interest among girls, results from the particular recruitment priorities of educators, or is shaped by biases or other factors. However, boys were still well represented across each of the high school programs. In contrast, the race/ethnicity of participating peers tended to closely reflect that of the overall student body, as did the percentage of peers who themselves identified as having some type of disability.

The academic and behavioral profiles of peers, however, were both unexpected and encouraging. Half of peers had an overall GPA of a B or above (i.e., 3.0 or higher). Among the rest, nearly one third had above a C (i.e., 2.00 to 2.99) and almost one fifth had even lower GPAs. This suggests program leaders may be heeding longstanding calls to avoid limiting recruitment more narrowly to "high-achieving students" (Hughes & Carter, 2008, p. 30), "academically successful peers" (Carter, 2021, p. 339), or those without "academic difficulties" (Shukla et al., 1998, p. 411). Likewise, a modest proportion of volunteering peers were chronically absent (30%), had prior behavioral referrals (26%), or had previously been suspended (12%). Peers who are themselves struggling in some way at school should also be allowed opportunities to meet, support, and benefit from relationships with their schoolmates with disabilities. Moreover, these students may actually have much to gain from the experience. This diverse profile of participating peers provides new insights into the peers who choose to volunteer in this way.

Second, peers tended to experience more favorable outcomes while participating in their school's *Peer to Peer* program. The data suggest a small effect size for GPA, with significant increases in grade point average being evident among students, and nearly two thirds showing improvement on this measure of broad academic achievement. Furthermore, the increase in GPA was significantly larger for students with low pre-program GPAs (GPAs of 2.0 or less) than for students with higher pre-program GPAs (GPAs greater than 2.0). Academic gains have been self-reported by peers in several classroom-based peer-mediated studies (e.g., Bensted, 2000; Cook, 2017; Riesch, 2013). It's possible that supporting the educational inclusion of students with disabilities equipped peers with skills they could use in their own learning or required them to be more engaged in class. Likewise, peers had significantly fewer absences while participating in *Peer to Peer*, with data indicating a moderate effect size for this variable. The decrease in absences was significantly larger for students with low pre-program GPAs, than for students with higher pre-program GPAs. It may be that peers were more

motivated to regularly attend school knowing they had some responsibility for supporting a fellow student or perhaps they had developed a valued relationship with someone they looked forward to seeing. We can only speculate about how their experiences in this program may have contributed to improvements in these two measures. Nevertheless, these overall patterns are quite intriguing. Moreover, there is little evidence being a peer partner is detrimental. Instead, the outcomes on these measures are overwhelmingly positive or occasionally neutral.

Third, the subset of peers who initially demonstrated behavioral challenges showed some improvements across the semesters in which they served as peer partners. Both behavioral referrals and suspensions were significantly lower at the end of two semesters of involvement in *Peer to Peer*, with data indicating a small to medium effect size. These particular behavioral benefits have not been reported in prior studies in secondary schools (Schaefer et al., 2016; Travers & Carter, 2022). Anecdotally, we have often noticed some degree of reluctance among educators to invite the involvement of peers who have had recent behavioral infractions. Such peers are sometimes considered poor role models or there may be concerns about the quality of supports they would provide. However, our pilot study suggests that involvement in *Peer to Peer* may actually benefit this subset of students in important ways.

Effect size estimates for outcomes related to these academic and behavioral variables were generally small to medium. Yet, for an intervention that has generally been viewed as targeting the needs of students with disabilities, these data are encouraging since they suggest that there may be palpable effects for peer partners, making peer-mediated interventions an attractive intervention for school professionals who wish to provide benefits to students with and without disabilities.

## Limitations

Several limitations to this pilot study should be considered carefully. First, the design of this study was longitudinal, not experimental. In the absence of a causal design, we cannot be sure that improvements in these four measures are the result of participating in *Peer to Peer*. It is possible that other factors concurrent to their involvement in the program contributed more to these changes. Future studies could address this by seeking additional information about school initiatives that might be contributing to changes in student performance, such as multitiered systems of support or school climate programs. Moreover, other personal factors (e.g., past experience, peer attitudes and expectations) beyond the three demographic variables we examined should be considered in future studies. Second, our

analyses were constrained to measures ordinarily collected by each of these eight high schools. It would be interesting to also know how school involvement, peer relationships, and social status changed over time, but such measures were not readily available. Third, we partnered with only eight among the hundreds of schools that were implementing *Peer to Peer* at the time of the study. Although we invited diverse schools to this pilot study, their findings may not be representative of all schools across the state or country. Fourth, the experiences of each peer partner are unique based on the school they attend, the students whom they support, and the contexts in which they spend time together. Schools did not keep detailed reporting on the day-to-day experiences of peers. Thus, we can only speculate on what aspects of the *Peer to Peer* program might be associated with any of the changes described in this paper. Fifth, we are not able to report on the formative or summative grades of peer partners specific to their *Peer to Peer* class. Such information would provide additional insight into whether peers were indeed carrying out their support roles as expected.

## Implications for Research

Additional research is needed to further explore several aspects of peer impact. First, future studies should incorporate post-experience interviews or surveys of peer partners to ask about any changes they notice and the explanations they offer for reported improvements. Peers are in unique position to examine why their grades may be rising, their attendance increasing, and their behaviors improving. Likewise, they could speak to other less observable benefits they are accruing as a result of their involvement (see Travers & Carter, 2022). Second, interviews with the educators who lead these programs could also be insightful. Peer-mediated studies rarely address the reasons teachers invite or select certain peers over others (Schaefer et al., 2016). It would be interesting to hear how teachers approach the recruitment process at their schools and their explanations for why the demographics of participating peers are slanted in any particular direction. Third, the longitudinal impact of peer-mediated programs like *Peer to Peer* should be explored. Very few studies have examined the impact of these interventions beyond a single semester (e.g., Kishi & Meyer, 1994). Determining whether positive outcomes maintain over time could bolster support for these schoolwide programs. Fourth, the ways in which peer-mediated programs like *Peer to Peer* are implemented looks somewhat different across the grade span. Future studies should examine whether elementary and middle school peers also experience the same types of improvements in academic and behavioral outcomes as do high school peers. We suspect that changes

in absenteeism and suspensions would be more muted in the earlier grades. Fifth, the relationship between implementation fidelity and peer outcomes warrants further exploration. Although part of a common program, the supports and experiences of each peer partner varies somewhat based on the students they are assisting and the settings which they work together. Knowing more about the daily roles and responsibilities of peers would enable more fine-grained analyses of how different experiences might lead to different outcomes.

## Implications for Practice

These findings also have several implications for practice. First, educators, including school psychologists, should reflect on how they recruit peers to this program and on the demographics of participating peer partners. Peers from throughout the entire school should have opportunities to meet and get to know their schoolmates with autism. Educators may need to refine their recruitment strategies to ensure there is broad awareness of this opportunity and adequate encouragement for diverse peers to participate.

Second, many peers experienced positive outcomes during their involvement in *Peer to Peer*. Educators might consider identifying and inviting peers for whom the particular benefits of peer-mediated programs might be especially relevant. For example, prior studies suggest peers may develop valued social relationships, improve their knowledge about and attitudes toward disability, develop enviable personal qualities (e.g., empathy, kindness, compassion), learn new skills, and improve their self-perceptions (Travers & Carter, 2022). The current study adds academic and behavioral impacts to this list. Peers who may struggle in any of these areas could be strong candidates for involvement in *Peer to Peer*. Although we did not include measures of school belonging in this study, prior research suggests that students who feel more accepted, respected and included in the school social environment, are more likely to have positive academic and behavioral outcomes (Korpershoek et al., 2020). Perhaps students who participate in peer-mediated interventions feel more connected to their schools, which in turn leads to reductions in behavior or improvements in academic engagement. As an alternative explanation, some coordinators reported they strategically involved peer partners in courses that would enhance their learning outcomes. For example, a peer partner attended algebra during second hour for a grade, and attended again in fifth hour as a peer support. This allowed the student to hear lecture information twice, and complete practice activities more than one time, an arrangement that could contribute to some of the academic benefits noted in the study.

Third, educators should track outcomes for participating peers, just as they should for students with autism. Knowing how peers are benefitting from their ongoing experiences can be helpful when advocating to sustain or expand a *Peer to Peer* program within a school district. Some peers could experience less favorable outcomes while in the program. For example, there were peers in this study whose grades decreased and absences or referrals increased. Coordinators could regularly review peer data and provide additional training and support to peer partners who struggle academically or behaviorally while they participate in the program. Additionally, *Peer to Peer* teams might also design their programs to include groups of peer partners as was done in this pilot project, a model that can build friendships amongst students, foster engagement in shared problem solving, and allow opportunities to rotate peer partners out of their roles if they require substantial academic or behavior support. Keeping abreast of these changes and understanding more about the smaller subset of students who do not show improved outcomes during their participation in *Peer to Peer* can help ensure that all peers are receiving the support and guidance they need in the midst of their experiences.

## CONCLUSION

Prior studies confirm that peer-mediated interventions are effective practices for enhancing the educational and social outcomes of students with autism and other developmental disabilities (Carter, 2021; Steinbrenner et al., 2020). This study provides new insights into the peers who participate in these interventions and the ways they are impacted by their involvement. Expanding the availability of these research-based interventions may be enhanced by knowing more about the mutual benefits students with and without disabilities can experience as they spend time together throughout the school day. We hope this pilot study will spur additional research aimed at better understanding the reciprocity of these widely advocated practices.

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