Effects of Peer Support Interventions on Students' Access to the General Curriculum and Social Interactions

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Peer support interventions are emerging as an effective alternative to traditional paraprofessional models for assisting students with moderate to severe disabilities to access the general curriculum. To contribute to the refinement of peer support interventions, we evaluated the impact of altering the number of participating peers on the social and academic outcomes of students with and without disabilities. Our findings indicated that changes in the configuration of peer support arrangements differentially affected student outcomes. Specifically, higher levels of social interaction and contact with the general curriculum were observed when students with disabilities worked with two peers relative to one peer. The additive benefits of a second peer provide guidance to educators concerning the implementation of peer support interventions in inclusive classrooms.

DESCRIPTORS: inclusion, peer supports, peer-mediated instruction, general education curriculum, social interaction, students with severe disabilities

Recent legislative and policy initiatives are challenging schools to reconsider the manner in which educational services are provided to students with moderate to severe disabilities (e.g., Individuals with Disabilities Education Improvement Act of 2004, PL 108-446; National Council on Disability, 2004; No Child Left Behind Act of 2001, PL 107-110; President's Commission on Excellence in Special Education, 2002). Specifically, schools are being encouraged to ensure that all students, with and without severe disabilities, are provided

supports necessary to access and demonstrate progress within the general curriculum (Agran, Alper, & Wehmeyer, 2002). In response, students with severe disabilities increasingly are receiving a greater proportion of their educational services within general education classrooms (U.S. Department of Education, 2002). However, ensuring that these students meaningfully participate academically and socially within the general curriculum remains a formidable task.

The intensive support needs of students with severe disabilities (American Association on Mental Retardation, 2002; Kennedy & Horn, 2004), coupled with the heightened challenges to inclusion associated with secondary school environments (e.g., Fox & Ysseldyke, 1997; York & Tundidor, 1995), have led researchers and educators to identify and evaluate effective support models for ensuring that students with severe disabilities access and progress within the general curriculum. Currently, paraprofessionals have become the dominant approach used by schools to support students' involvement in general education classrooms (Brown, Farrington, Knight, Ross & Ziegler, 1999; Giangreco, Edelman, Broer, & Doyle, 2001). The heavy reliance on paraprofessionals, however, has raised concerns among researchers, educators, and parents regarding the proper roles of support staff in inclusive settings (e.g., Giangreco & Doyle, 2002; French & Chopra, 1999; Mueller, 2002). Specifically, over-reliance on paraprofessionals may (a) limit students' social interactions with their classmates (Hemmingsson, Borell, & Gustavsson, 2003; Marks, Schrader, & Levine, 1999), (b) hinder student achievement (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001), (c) stigmatize students (Broer, Doyle, & Giangreco, in press), (d) prolong unnecessary dependence on adults (Giangreco, Edelman, Luiselli, & MacFarland, 1997), and (e) decrease contact between students with disabilities and certified general education teachers (Giangreco, Broer, & Edelman, 2001). These unintended consequences have led researchers to advocate for alternative support models that circumvent the challenges associated with an over-reliance on

paraprofessionals (Cushing, Clark, Carter, & Kennedy, 2003; Giangreco, Halvorsen, Doyle, & Broer, 2004).

Peer support interventions are emerging as an effective alternative to traditional paraprofessional models for supporting students with disabilities to access the general curriculum. Stemming from classwide peer tutoring, cooperative learning, and other peer-mediated techniques, peer support interventions involve one or more peers without disabilities providing academic and social support to a student with disabilities (Cushing & Kennedy, 2004; Goldstein, Kaczmarek, & English, 2002). Peers are taught to (a) adapt class activities to facilitate student participation, (b) provide instruction related to IEP goals, (c) implement relevant behavior intervention plans, (d) provide frequent feedback to the student, and (e) promote communication between the student with disabilities and others (Cushing & Kennedy, 1997). While providing this assistance to their classmates, peers receive ongoing monitoring, feedback, and assistance from paraprofessionals and general education teachers. Thus, paraprofessionals shift from an exclusively one-on-one role to a broader support role in which they monitor students with disabilities and their peers, provide help as needed, and assist other students within the general education classroom.

Relative to traditional paraprofessional models, research indicates that peer support interventions contribute to higher levels of active engagement for students with and without disabilities (Shukla, Kennedy, & Cushing, 1998, 1999), increase social interactions (Kennedy, Cushing, & Itkonen, 1997), decrease levels of problem behavior for students with disabilities (McDonnell, Mathot-Buckner, Thorson, & Fister, 2001), improve academic performance (Dugan et al., 1995), and allow the acquisition of functional skills (Werts, Caldwell, & Wolery, 1996). Moreover, the effectiveness of peer support interventions has been documented across grade levels (i.e., elementary, middle, and high school) and disability categories (e.g., intellectual disabilities, autism, and multiple disabilities).

The initial effectiveness of peer support interventions having been demonstrated, attention is now turning to refined experimental analyses of these intervention packages (Kennedy, 2004). Systematic assessments of peer support arrangements aimed at understanding the roles that various intervention components have on student outcomes should hold interest for both researchers and practitioners. Such analyses can enable researchers to (a) identify effective and ineffective intervention components; (b) understand not just how an intervention influences behavior, but why; and (c) determine which intervention configurations produce optimal outcomes. For practitioners, these analyses can translate into the identification of effective, practical interventions that maximize both tractability and impact.

Various elements of peer support interventions are likely to contribute differentially to positive student outcomes. The number of peers assigned to work with the student with disabilities is one such element and has clear implications for the manner in which students with severe disabilities are supported in accessing the general curriculum. In prior studies, researchers have implemented peer support arrangements comprising either (a) one peer (e.g., Cushing & Kennedy, 1997; Gilberts, Agran, Hughes, & Wehmeyer, 2001; McDonnell et al., 2001; Shukla et al., 1998) or (b) two or more peers (Garrison-Harrell, Kamps, & Kravits, 1997; Hunt, Staub, Alwell, & Goetz, 1994; Kennedy et al., 1997; Shukla et al., 1999). Although varying the number of students participating in peer support arrangements is likely to have a differential impact on student outcomes (Sasso, Mundschenk, Melloy, & Casey, 1998), this particular parameter has yet to be evaluated within general education classrooms.

The current study was designed to evaluate the impact of altering the number of participating students in peer support arrangements on the social and academic outcomes of students with severe disabilities. In addition, we examined how these parametric variations influenced academic and social outcomes for the general education students who are providing peer support. Our goal was to contribute to the refinement of peer support interventions and provide educators and researchers with information regarding the preferred configuration of such arrangements.

Method

Participants

Ethan was a 17-year-old Caucasian male with moderate intellectual disabilities and a history of physical aggression, self-injury, and noncompliance. He had a behavior support plan and took methylphenidate (Ritalin) during the study. He communicated in short phrases but rarely initiated social interaction with classmates. Randy was a 12-year-old Caucasian male with autism and moderate intellectual disabilities. He communicated using one- to three-word utterances. He required frequent prompting to stay on task and remain in his seat during class. Cara was a 13-year-old Caucasian female with moderate intellectual disabilities and autism. She spoke with teachers using short, perseverative phrases but was socially withdrawn and rarely initiated social interactions with her classmates. All three students (a) were identified by their teachers as students who would benefit academically and socially from receiving support from their peers, (b) had IEP goals that addressed increasing their social interaction with students without disabilities, (c) indicated they would like to work with the peers identified by their classroom teachers, (d) agreed to participate, and (e) received consent from their care provider to participate.

Six general education students were selected for participation in this study because they (a) were enrolled in

the same class as the student with disabilities, (b) were identified by their classroom teacher as a student who would be able to effectively provide academic and social support to classmates with severe disabilities, (c) agreed to participate, and (d) provided consent from their care provider to participate. Briana and Jaclyn, both 17-year-old Caucasian females, worked with Ethan and were A and B grade level students, respectively. Dalton and Luis, both 11-year-old Caucasian males, worked with Randy and were B grade level students. Kailey and Karin, 13- and 14-year-old Caucasian females, worked with Cara and were B grade level students. Prior to participating in this study, none of the students had participated in a peer support intervention.

Settings

Participants attended a middle ($N = 913$ students) or high school ($N = 1,724$ students) in a suburban school district ($N = 22,450$ students). Three years prior to this study, the local education agency began transitioning to a policy of serving all students with disabilities in full-time general education classrooms. Participating students with disabilities had less than 2 years of general education participation experience. Criteria for selecting classes within which to observe included (a) a student with severe disabilities already was enrolled in the class, (b) the class addressed a core academic content area, and (c) general education teachers and paraprofessionals within the classroom consented to participate.

Ethan, Briana, and Jaclyn were enrolled in an 11th-grade English class. Instruction was provided predominantly using small groups (e.g., peer editing or book reports) or independent seat work (e.g., reading, testing, or writing personal memoirs). A total of 22 students were enrolled in the class. In addition to the general education teacher (3 years of teaching experience), one paraprofessional (10 years of teaching experience) was assigned to the classroom to provide additional instructional support to Ethan.

Randy, Dalton, and Luis were enrolled in a sixth-grade science class. Instruction involved a combination of lecture and small group learning activities (e.g., science projects, group experiments). The class comprised 29 students. In addition to the general education teacher (5 years of teaching experience), one special education teacher (7 years of teaching experience) was assigned to the classroom to provide additional instructional support to Randy and one other student with severe disabilities.

Cara, Kailey, and Karin were enrolled in an eighth-grade science class. Course content was presented to students through lecture, with occasional independent (e.g., worksheets, reading, testing) and small group work (e.g., class presentations, computer projects, science experiments). The class comprised 34 students. In addition to the general education teacher (13 years of teaching experience), a paraprofessional (10 years of teaching experience) was assigned to the classroom to provide instructional support to Cara and three other students with learning disabilities.

Dependent Measures and Recording

Both academic and social outcomes were assessed throughout this study. C*onsistency with the general curriculum* was defined as the student being provided instructional activities and materials that were aligned (i.e., identical or similar) with those provided to the remainder of the class by the general education teacher. Activities that were appropriately modified from the class curriculum with respect to difficulty, modality, response format, length, or materials were coded as consistent with the general curriculum. Non-examples included students coloring, working on assignments for other courses, completing other activities unrelated to the class theme for the day, or not being provided any instructional materials. *Contact with the general curriculum* was defined as a student being actively engaged in (i.e., attending to) instructional activities that were consistent with the activities required of the remainder of the class. Examples of contacting the general curriculum include a student listening to the teacher lecture, taking class notes, completing an assignment with peers, and reading independently. *Instructional format* was coded as (a) independent seat work, (b) one-on-one with a paraprofessional or special educator, (c) small group of two to eight students, and (d) large group of nine or more students. Multiple instructional formats could be coded during a single observation period.

A *social interaction* was defined as one student acknowledging another student using verbal or nonverbal (e.g., physical contact, pointing, gestures) communicative behaviors. Examples of social interactions included greetings, talking about upcoming events or activities, providing information, assisting with an assignment by asking or answering questions, and introducing a student to other classmates. Social interactions were coded according to whether they occurred between (a) students with disabilities and peers, (b) students with disabilities and other classmates without disabilities, or (c) peers and other classmates without disabilities. For each occurrence of an interaction, perceived *quality of interaction* was rated by observers on a 5-point Likert-type scale with poles marked "poor quality" (1) and "high quality" (5). Ratings of interaction quality were based on students' affect, reciprocity, and interaction content.

Observations were conducted two or three times per week using a 1-minute momentary time sampling procedure. Using stopwatches, occurrence or nonoccurrence of each dependent measure was recorded by observers (i.e., three graduate students in special educa-

tion) at the end of each 60-second interval and reported as the percentage of intervals in which the dependent measure occurred. Observations began when students arrived in class, continued throughout the remainder of each 46- or 50-minute class period, and were terminated only when the student with disabilities or a peer left the classroom. Only observations exceeding 30 minutes were included in the analyses (97% of observations).

Experimental Design and Procedures

A-B-A-B (Randy) and B-A-B-A designs (Cara and Ethan) were used to conduct parametric analyses of the effects of peer support arrangements (Kennedy, 2005). Specifically, parametric analyses were used to evaluate how varying an intervention component along some quantitative dimension (e.g., the number of peers working with the student with disabilities) affected participant outcomes (e.g., academic performance and social interactions of students with and without disabilities). In this study, we systematically altered the number of participating peers to establish a functional relation between the number of peers and behavior change.

Before beginning the parametric analyses, peer support arrangements had been developed and implemented for Ethan, Randy, and Cara using the following procedures. After being recruited by the general education teacher, one or two peers sat directly next to the student with disabilities. Peer(s) were taught by both school and research staff strategies for (a) adapting class activities to allow students' participation, (b) providing instruction related to IEP goals, (c) implementing relevant behavior intervention plans, (d) providing frequent feedback to the student, and (e) promoting communication between the student with disabilities and other students in the class (Cushing & Kennedy, 1997; Shukla et al., 1999). Examples of adaptations provided by peers included rewording and paraphrasing questions, breaking assignments into smaller tasks, facilitating partial participation in class activities, and modifying course materials. Initial training of peers provided an overview of these strategies, lasted between 2 and 4 days, and was implemented as peers were paired with their classmates with disabilities. The peers subsequently received ongoing monitoring and feedback regarding their implementation of these strategies from special educators or paraprofessionals. The special educator and paraprofessionals received direct training from research staff regarding how to maintain peer support arrangements. This training lasted approximately 1 week and involved research staff (a) providing a verbal description of peer support intervention components to school staff, (b) completing an instructional activities assessment (Cushing, Clark, Carter, & Kennedy, in press) with school staff delineating how peers should assist students with disabilities during various types of large and small group activities and independent seat work, and (c) modeling strategies for monitoring and providing feedback to peers. Training provided to school staff was terminated after they implemented the monitoring and feedback components of the intervention with 100% fidelity for 3 consecutive days, as determined by a checklist of intervention procedures.

Parametric analyses began at least 2 weeks after the peer support arrangements were established for the students with disabilities. These analyses were conducted using the following procedures. Before the beginning of the class period, the special education teacher or paraprofessional was asked by research staff to implement condition A (i.e., pair one peer with the student with disabilities) or condition B (i.e., pair two peers with the student with disabilities). One peer was designated the primary peer support and worked with the student with disabilities across all study conditions. The second peer was present only during condition B.

During condition A, one peer was paired with each student with disabilities. The special educator or paraprofessional provided assistance to all students in the class and provided additional logistical support to the general education teacher as needed. Throughout each class period, special education staff monitored and periodically provided feedback to students on their peer support activities. If students had questions or required help, special education staff immediately provided necessary assistance.

Condition B was identical to condition A except that students with disabilities were paired with two peers rather than one. Both peers were asked to share responsibilities (e.g., adapting activities, providing behavioral support, facilitating interactions) with the other for providing ongoing support to the student with disabilities. Efforts were not made by school staff to equalize the support behaviors provided by each peer.

Interobserver Agreement

Interobserver agreement was assessed across both conditions of the study for all three participants with disabilities and their peers during a total of 35% of observations. A second graduate student simultaneously, but independently, observed and recorded information on all measures. The percentage agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Overall interobserver outcomes were as follows: consistency with the general curriculum ($M = 99\%$; range, 94–100%), contact with the general curriculum ($M = 97\%$; range, 81–100%), instructional format ($M = 95\%$; range, 86–100%), social interaction between students with disabilities and peers ($M = 96\%$; range, 88–100%), social interaction between students with disabilities and other classmates ($M = 98\%$; range, 86–100%), social interaction between peers and other classmates ($M = 96\%$; range,

86–100%), and quality of interaction ($M = 89\%$; range, 50–100%).

Results

General Curriculum Access and Social Interaction

Academic and social outcomes for Ethan are displayed in Figure 1. Mean percentage of curricular consistency was 100% (range, 98–100%) when he worked with two peers compared with 94% (range, 83–100%) when working with one peer. When working with two peers, his mean percentage of curricular contact was 87% (range, 81–100%) compared with 72% (range, 48–95%) when working with one peer. These data demonstrate higher levels of consistency and contact with the general curriculum for Ethan when he was paired with two peers relative to when he worked with one peer. Systematic differences in the percentage of social interaction between Ethan and his peers also were found between conditions, with a higher mean percentage of interaction occurring when Ethan was paired with two peers ($M = 50\%$; range, 41–74%) relative to one peer ($M = 27\%$; range, 10–50%). Social interaction with other classmates showed no differences between conditions. Academic and social outcomes for Briana (primary peer support for Ethan) are presented in Table 1. No systematic differences were observed across condi-

tions with regard to consistency or social interaction with other classmates. However, the percentage of intervals contacting the general curriculum was higher when she was accompanied by a second peer ($M = 95\%$; range, 73–100%) relative to when she worked alone with Ethan ($M = 85\%$; range, 43–98%). Social interaction between Briana and Ethan followed a similar pattern, with higher levels of interaction during the two-peer condition ($M = 40\%$; range, 19–71%) compared with the one-peer condition ($M = 26\%$; range, 10–47%).

Figure 2 presents academic and social outcomes for Randy. His consistency with the general curriculum showed only marginal differences between conditions, with high rates of overall curricular consistency. A clear differentiation between conditions, however, was found in contact with the general curriculum and social interaction with peers. Specifically, average percentage of curricular contact was 93% (range, 78–98%) when he worked with two peers compared with 79% (range, 57–90%) when he worked with one peer. Similarly, his percentage of intervals interacting with peers was 46% (range, 29–67%) when working with two peers relative to 21% (range, 13–36%) when working with one peer. Consistent differences in social interaction with other classmates were not found between conditions. Consistent differences between conditions were not found for
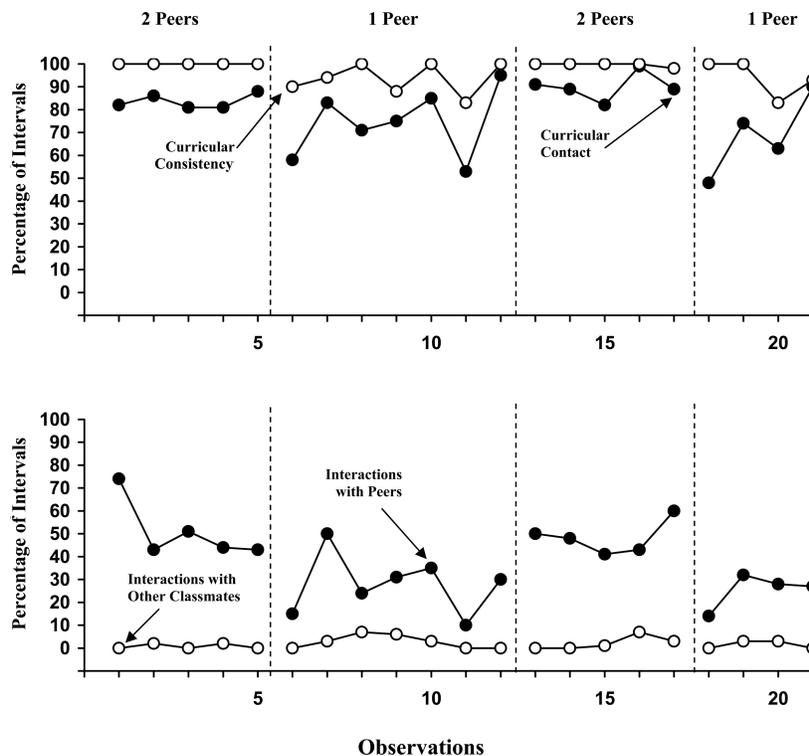

Figure 1. Academic and social outcomes for Ethan. The top panel displays Ethan's contact (closed circles) and consistency (open circles) with the general curriculum. The bottom panel shows Ethan's social interactions with his peers (closed circles) and other classmates (open circles).

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Table 1
Primary Peer Supports' Academic and Social Outcomes During One and Two Peer Conditions

|	One peer		Two peers	
	M	Range	M	Range
Briana				
Consistency	99%	90% to 100%	100%	100%
Contact	85%	43% to 98%	95%	73% to 100%
Social interaction w/student with dis.	27%	10% to 47%	40%	19% to 71%
Social interaction w/other classmates	17%	5% to 29%	17%	4% to 28%
Dalton				
Consistency	100%	100%	100%	100%
Contact	96%	85% to 100%	99%	96% to 100%
Social interaction w/student with dis.	24%	13% to 36%	32%	20% to 48%
Social interaction w/other classmates	11%	0% to 26%	19%	2% to 39%
Kailey				
Consistency	100%	100%	100%	100%
Contact	97%	84% to 100%	97%	91% to 100%
Social interaction w/student with dis.	30%	11% to 60%	30%	20% to 41%
Social interaction w/other classmates	8%	0% to 22%	30%	15% to 58%
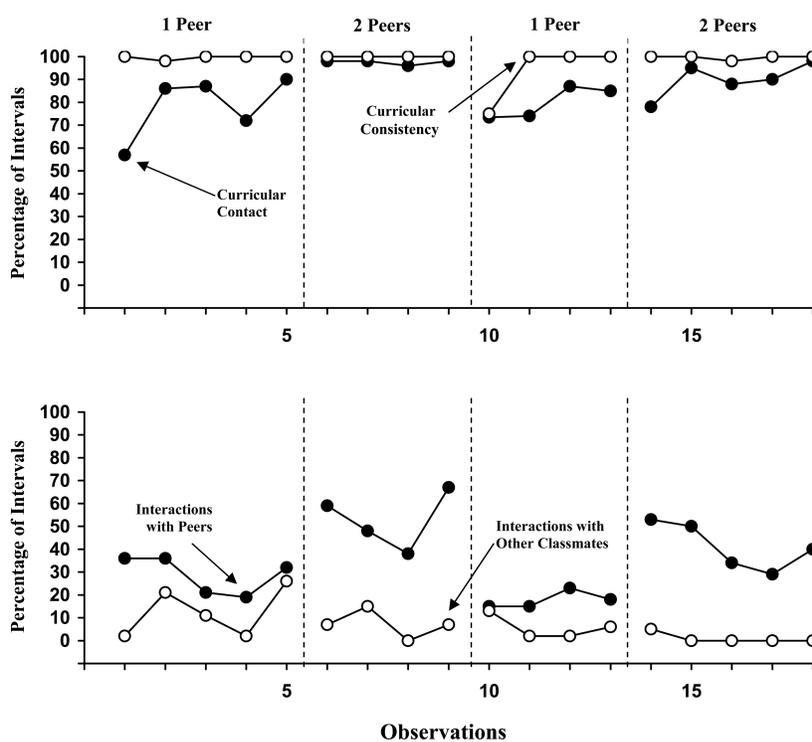
Figure 2. Academic and social outcomes for Randy. The top panel displays Randy's contact (closed circles) and consistency (open circles) with the general curriculum. The bottom panel shows Randy's social interactions with his peers (closed circles) and other classmates (open circles).

Dalton (primary peer support for Randy) with respect to consistency or contact with the general curriculum (see Table 1). Dalton interacted with Randy slightly more frequently when accompanied by a second peer ($M = 32\%$; range, 20–48%) than when working alone with Randy ($M = 24\%$; range 13–36%). Only slight differences between conditions were found on the average percentage of social interactions Dalton had with other classmates, with higher levels of social interaction when accompanied by a second peer ($M = 19\%$; range, 2–39%) relative to when working alone ($M = 11\%$; range, 0–26%).

Figure 3 displays the academic and social outcomes for Cara. Activities and materials were consistent with the general curriculum 100% of the time, across all conditions. No differences in contact with the general curriculum were found between the one-peer condition ($M = 93\%$; range, 84–100%) and the two-peer condi-
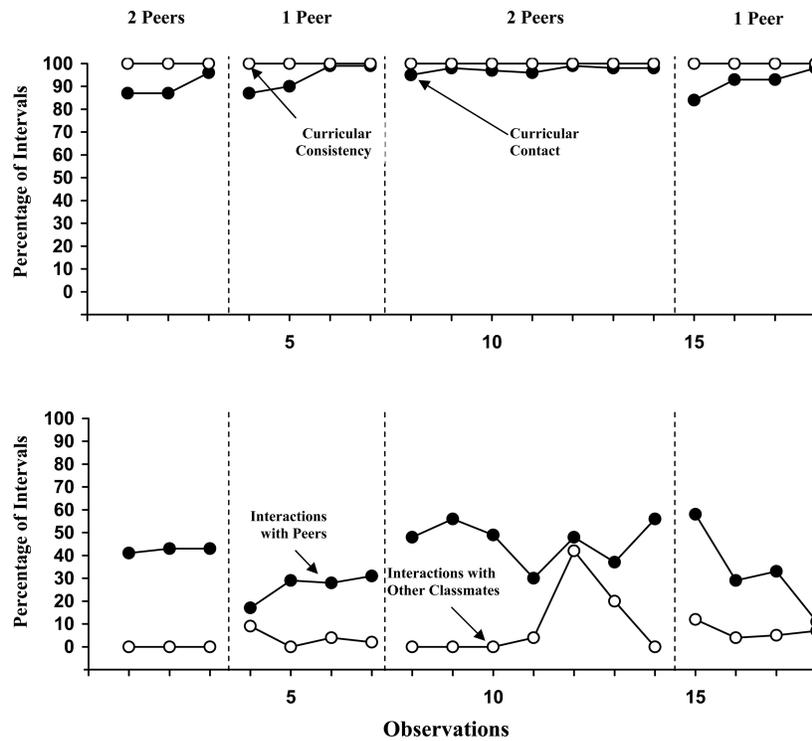
Figure 3. Academic and social outcomes for Cara. The top panel displays Cara's contact (closed circles) and consistency (open circles) with the general curriculum. The bottom panel shows Cara's social interactions with his peers (closed circles) and other classmates (open circles).

tion ($M = 95\%$; range, 87–100%). The data for social interaction with peers demonstrated a clearly differentiated pattern between conditions. Specifically, the average percentage of intervals for Cara interacting with peers was 30% (range, 11–58%) when she worked with one peer and 45% (range, 30–56%) when she worked with two peers. For Kailey (primary peer support for Cara), no systematic differences were found between conditions on measures of (a) consistency with the general curriculum, (b) contact with the general curriculum, or (c) social interaction with the student with disabilities (see Table 1). Social interaction with other classmates occurred more frequently when she was accompanied by a second peer ($M = 30\%$; range, 15–58%) relative to when she worked alone with Cara ($M = 8\%$; range, 0–22%).

Instructional Format

Across conditions, the instructional format for students with disabilities was large group (44%), small group (44%), independent seatwork (9%), and one-to-one with a special education teacher or paraprofessional (4%). Additional analyses were conducted to examine differences in the frequency of social interaction by instructional format (Fig. 4). Overall, social interaction between students with disabilities and students without disabilities (i.e., peers or other classmates) occurred most frequently during small group instruction
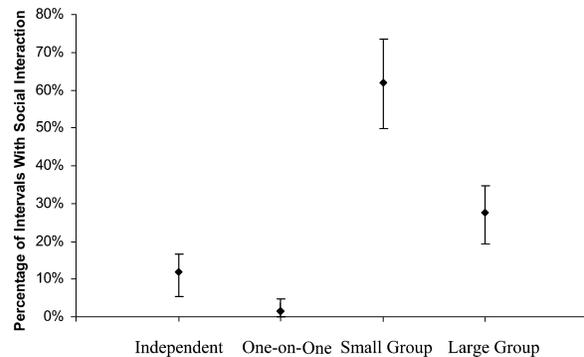

Figure 4. Overall mean percentage of intervals containing social interaction between students with disabilities and all classmates without disabilities across instructional formats. Bars indicate range.

(60%), followed by large group instruction (28%) and independent seatwork (12%). During one-on-one instructional formats, social interaction occurred during less than 2% of intervals. Similar patterns were found for both the one- and two-peer conditions.

Quality of Interaction

Overall, social interactions between students with disabilities and their peers were rated as having a mean of 3.3 (range, 2–5) and did not differ depending on the

number of peers involved in the intervention (Table 2). Consistent differences in ratings of the interaction quality between instructional formats also were not evident. These findings suggest that the quality of social interaction was not affected by the number of peers or instructional formats.

Discussion

We examined the effects of varying the number of peers on the social and academic outcomes of students with and without severe disabilities. Our findings indicate that changes in the configuration of peer support arrangements differentially affected student outcomes, with higher levels of social interaction and contact with the general curriculum observed when students with disabilities worked with two peers. These findings extend the developing literature on peer support interventions by examining how alterations in peer support configurations differentially affect student outcomes.

Research has documented the benefits associated with peer interaction (Bukowski, Newcomb, & Hartup, 1996; Goldstein et al., 2002; Ryndak & Fisher, 2001), underscoring the importance of identifying effective interventions to increase the social interactions of students with severe disabilities. Our data show that students with severe disabilities engage in social interactions more frequently when working with two peers in comparison to one peer. This difference in social interaction may be attributable to several factors. The addition of another student to the peer support arrangement may provide additional interaction opportunities by increasing (a) the number of initiations directed to the student with disabilities and/or (b) the likelihood that social initiations emitted by students with disabilities would be responded to by peers. Moreover, the addition of a second peer may further the cooperative nature of peer support interventions, augmenting interdependent contingencies in which all students must interact to complete class activities (Kennedy, 2001; Schmitt, 1984). Additional research is needed to examine more closely the functional role these factors may serve in influencing social outcomes.

Alterations in the number of peers did not, however, affect students' interactions with other classmates. Across conditions, students with disabilities engaged in few interactions with classmates beyond the peer sup-

port arrangement. Although this may initially seem disappointing, the limited extent of peer interaction may be typical of more academically oriented and lecture-dominated secondary-level general education classes. Research indicates that most peer interaction in middle-school and high-school general education classrooms is academic-related, with non-class-related conversation actively discouraged by educators (Carter, Hughes, Guth, & Copeland, in press; Granstroem, 1996). Peer support arrangements, therefore, may provide an avenue by which the social goals of students with severe disabilities can be furthered in settings within which social interaction might otherwise be discouraged by educators.

Researchers and educators need to identify effective instructional strategies that promote academic progress for students with severe disabilities within the general curriculum (Agran et al., 2002; Harrower & Dunlap, 2001). We found that the amount of time students with severe disabilities were actively engaged in instructional activities aligned with the general curriculum was increased when a second peer was involved. For two of the three students with severe disabilities (Ethan and Randy), contact with the general curriculum was higher when two peers were present. The third student (Cara) was academically engaged at ceiling levels throughout the study. What accounts for variations in curricular contact across conditions? The addition of a second peer to the support arrangement may increase the amount of systematic instruction, instructional feedback, and response opportunities the student with disabilities receives, facilitating increased contact with the general curriculum.

Irrespective of the number of participating general education students, peer support interventions in our study maintained the alignment of students' activities with the general curriculum. The high and stable levels of curricular consistency across conditions may be a result of the initial training peers received after agreeing to be paired with the students with disabilities and the ongoing assistance provided by paraprofessionals and special educators. Peers readily acquired strategies for promoting students' involvement in class activities during training and ensured that students with disabilities had access to appropriately modified materials throughout each class period. Our findings indicate that peers can be taught to modify instructional activities effectively and eliminate the disconnect that often exists between the instruction received by the student with severe disabilities and classmates without disabilities in general education classrooms. Unfortunately, ceiling effects on consistency with the general curriculum restricted our ability to make comparisons between experimental conditions on this outcome measure. Therefore, all that can be concluded for this independent variable is that peer support interventions are as-

Table 2
Quality of Interaction[a] Between Students with Disabilities and Peers

Condition	Ethan M (SD)	Randy M (SD)	Cara M (SD)
1 peer	3.4 (0.5)	3.1 (0.2)	3.2 (0.2)
2 peers	3.2 (0.3)	3.5 (0.2)	3.1 (0.2)

[a] Based upon a 5-point Likert-type scale (1 = poor quality; 5 = high quality).

sociated with high levels of access to the general curriculum irrespective of the number of peers involved.

Third, neither peer support configuration had a detrimental impact on participating general education students. The primary peer support's curricular contact did not decrease as a result of the addition of a second peer; in fact, slight increases in curricular contact were evident for all three primary peer supports. This finding corroborates previous research indicating that peers are not hampered academically by their support role and may, in fact, benefit academically from assuming support responsibilities (e.g., Cushing & Kennedy, 1997; Shukla et al., 1998). Moreover, it alleviates possible concerns that the addition of a second peer might distract the other peer support from his or her own class responsibilities. Observed increases in curricular contact for the primary peer support may be attributable to several factors. In addition to supporting the student with severe disabilities, both peers may have provided academic support to each other as needed. Moreover, the peers appeared to alternate who was providing support to students with disabilities at any one time—that is, while one peer completed his or her own class work, the other provided support to the student with disabilities, switching roles periodically throughout the class period. Future research should document how the specific support behaviors exchanged among peers might vary across peer support configurations.

Future research should address the limitations of this study. First, our social interaction measures did not distinguish among the relative contributions of each student (e.g., initiations, responses) or the interaction content (e.g., academic vs. nonacademic conversational topics). Anecdotally, we noted that the majority of the students' interactions were academically related. However, future studies should extend our analyses to additional social outcomes, such as interaction reciprocity and exchange of social support behaviors. Second, our analyses would have been strengthened by the addition of outcome measures that more directly assess students' academic progress. Because of the relatively rapid manner in which conditions were alternated in this study, it was not possible to use assignment completion, quiz/test performance, progress on IEP goals, or overall grades as measures of academic performance. Extending the duration of the experimental conditions might enable researchers to isolate the effects of each condition on these academic outcomes. Moreover, the challenges associated with documenting academic progress in the general curriculum for students with severe disabilities in secondary school settings are evidenced by the paucity of research studies incorporating academic outcome measures. The inclusion of additional indicators of academic performance, such as curriculum-based measures or evaluations of permanent work products, would enable researchers to document more precisely what it looks like to progress academically within the general curriculum. Third, our findings would be strengthened by the inclusion of educators' and students' perspectives concerning the benefits and challenges associated with implementing one- versus two-peer support arrangements. The inclusion of qualitative measures of intervention procedures and outcomes might provide information useful for improving this intervention.

Implications for Practice

These findings have implications for the design and delivery of educational supports to students with severe disabilities within academically oriented general education classrooms. Relative to younger grades, secondary-school classrooms are typically characterized by an emphasis on academic content, lecture-dominated instructional arrangements, larger class sizes, and higher expectations for independent student performance. These contextual factors require educators to think creatively about strategies for ensuring access to the general curriculum for students with severe disabilities. Our findings confirm that peer support interventions are an effective response to the challenges of promoting secondary inclusion. Moreover, they suggest an alternative support role that paraprofessionals might assume within inclusive classrooms. Students with severe disabilities showed high levels of contact and consistency with the general curriculum when paraprofessionals monitored and provided feedback to students in peer support arrangements. This corroborates the findings from other studies in which students with severe disabilities have been found to accrue greater social and academic benefits when paraprofessionals shift from a one-on-one to a facilitative support role (Causton-Theoharis & Malmgren, in press; Shukla et al., 1998, 1999).

Our findings also provide guidance to educators concerning the implementation of peer support interventions in inclusive classrooms. We documented evidence of the additive benefits of a second peer on both academic and social outcomes. Because the differences in implementation requirements between one- and two-peer support arrangements are relatively small, improved academic and social outcomes may be available to students with only minimal additional time and effort required on the part of educators. Furthermore, our findings suggests that educators should closely consider how variations in the individual components that make up a given intervention package might influence student outcomes. Such an understanding would guide educators in fine-tuning interventions in an effort to find the optimal balance between tractability and student outcomes within the context of their classrooms.

Our findings showed that peer support intervention outcomes are influenced by the number of participating general education students. In light of school reform initiatives stressing the importance of promoting access

to the general curriculum for students with severe disabilities, the identification and refinement of effective interventions for accomplishing this task remains an important and timely endeavor for researchers and educators. By developing peer support interventions that maximize both student outcomes and implementation efficiency, interventions are more likely to be adopted and maintained (Schwartz & Baer, 1991).

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