Increasing Peer Interactions for Students With Severe Disabilities Via Paraprofessional Training

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ABSTRACT: *As students with severe disabilities are included in general education settings, the use of paraprofessionals has expanded to meet these students' needs. Unfortunately, paraprofessionals can have the inadvertent effect of intensifying the social isolation of students with disabilities. This study investigated the effectiveness of a training program aimed at teaching four paraprofessionals to facilitate interactions between students with severe disabilities and their peers. A multiple baseline, single-subject design across four paraprofessional/student pairs was utilized. Observational data were collected over the baseline and postintervention phases. Rates of paraprofessional facilitative behavior increased following the intervention. Additionally, rates of student interaction increased immediately and dramatically and were maintained through the maintenance probe.*

The general education classroom has become the place where increasing numbers of students with disabilities are educated. Nationally, there are 5 1/2 million students with special needs, and slightly under half of these students in elementary schools are served in general education settings with their general education peers for more than 79% of the school day (U.S. Department of Education, 2002). Specifically, students with severe disabilities are included in general education settings with growing frequency, and increases are predicted to continue as inclusionary practices become the norm (U.S. Department of Education).

A major impetus for placing students with disabilities in general education classrooms is to allow them to reap the social and academic benefits afforded their peers without disabilities (Cullinan, Sabornie, & Crossland, 1992; Ferguson & Asch, 1989; Johnson & Johnson, 1991; Madden & Slavin, 1983; Wehman, 1990). Educational scholars have suggested that in an inclusive environment, being afforded the opportunity to learn from and care for one another enriches the lives of students (Vandercook, Fleetham, Sinclair, & Tetlie, 1998). The general education classroom is considered to be a fertile ground for the development of peer interactions and relationships. These peer interactions have been empirically linked to

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increased achievement (Johnson, 1981; Yager, Johnson, & Johnson, 1985) and increased self-esteem (Branthwaite, 1985; Kirova, 2001; Nave, 1990). However, for students with severe disabilities, these interactions and relationships may not occur naturally without appropriate support (Evans, Salisbury, Palombaro, Barryman, & Hollowood, 1992).

The most common strategy that school districts use to support students with severe disabilities in inclusive classrooms is to allocate a paraprofessional to work with the individual student (Giangreco, Broer, & Edelman, 1999; Giangreco, Edelman, Broer, & Doyle, 2001; Werts, Wolery, Snyder, & Caldwell, 1996; Wolery, Werts, Caldwell, Snyder, & Liskowski, 1995). In some cases, the involvement of paraprofessionals may be the crucial support that allows a student with intensive academic or behavioral needs to be educated in a general education classroom or school rather than being placed in a more restrictive, segregated setting (Martella, Marchand-Martella, Miller, Young, & Macfarlane, 1995).

Although the assignment of a paraprofessional is intended to positively impact the student, several studies have shown that the presence of a paraprofessional can actually have detrimental effects on the peer interactions of a student with a disability (Giangreco, Edelman, Luiselli, & MacFarland, 1997; Marks, Schrader, & Levine, 1999; Shulka, Kennedy, & Cushing, 1999). Specifically, Giangreco et al. (1997) found that paraprofessional proximity had a profoundly negative impact on peer interactions, which affected relationships with classmates. Paraprofessionals were considered to be a physical barrier that caused many of the peers in the study to avoid the student with a disability. Giangreco et al. (1997) also reported that peers sometimes saw students and paraprofessionals as a "package deal."

A second major problem that students with disabilities who are supported by a paraprofessional face is separation from classmates (Gian-

greco et al., 1997). Paraprofessionals were routinely observed removing the students with disabilities from their peers or class grouping (e.g., moving the student to a back table to work or to another room without consultation with or resistance from a teacher). Similarly, in a qualitative study by Malmgren and Causton-Theoharis (2003) of a student with emotional disturbance in an inclusive classroom, paraprofessional proximity was found to be the single most important classroom condition that negatively influenced peer interactions.

A growing body of research documents that paraprofessionals are not well prepared to perform their specific job responsibilities (Brown, Farrington, Knight, Ross, & Ziegler, 1999; Giangreco et al., 2001; Wadsworth & Knight, 1996). It has been suggested that paraprofessionals who work with students with complex learning, cognitive, and behavioral issues are the least trained individuals in the school even though they are working with challenging students (Brown et al.). Many paraprofessionals receive no training before starting their employment in the schools (Passaro, Pickett, Latham, & HongBo, 1994), and many paraprofessionals report that they received the majority of their training by simply talking to and shadowing other paraprofessionals in the schools (Giangreco et al., 1997). Unfortunately, the support of an untrained paraprofessional can have negative consequences that actually undermine the original social and academic goals of inclusion.

This study investigates the effectiveness of a training program aimed at teaching four paraprofessionals to facilitate interactions between students with severe disabilities and their peers. The research questions under investigation were as follows: Does training of paraprofessionals to facilitate interactions between students with and without disabilities increase the facilitative behaviors of the paraprofessionals? More important, does training of paraprofessionals increase the quantity of interactions that occur between students with disabilities and their peers? We predicted that the paraprofessional training would positively influence both the behaviors of paraprofessionals and the interactions of students. Based on the findings from other researchers (e.g., Hundert & Hopkins, 1992), we further predicted that gains in facilitative behavior of paraprofes-

sionals would level off at a lower point than gains in peer interaction, given that the goal of facilitative behavior is to encourage independent interactions that blossom into even more interactions as students create meaningful relationships with their peers.

METHOD

SETTING

The study took place in two public elementary schools in a mid-size, midwestern school district. The school district was chosen because of its size and demonstrated commitment to inclusion. Students with disabilities throughout the district attended their neighborhood schools and were taught primarily in general education classrooms. The participating district employed 473 paraprofessionals during the 2002–2003 academic year. These paraprofessionals worked primarily with students with special needs. The specific elementary schools in which the study took place were solicited based on the enrollment of students with severe disabilities who were served primarily in general education classrooms with the support of a paraprofessional. Two second-grade classrooms were utilized in "School A," and a kindergarten and a fourth-grade classroom were utilized in "School B." In each of the classrooms, a general educator was primarily responsible for the education of all students. The classes ranged in size from 15 to 22 students and the poverty rate, as determined by the percentage of students receiving free or reduced lunch, ranged from 10% to 25%.

PARTICIPANTS

Paraprofessional Participants. Study participants were comprised of four paraprofessional/student pairs. The paraprofessional participants were recruited from among paraprofessionals who were primarily responsible for supporting a student with a severe disability in a general education classroom. Three of the four participating paraprofessionals were female and all were Caucasian, ranging in age from 35 to 53 years. Their years of experience as a paraprofessional ranged from 3.5 to 7 years.

For all four paraprofessionals, the data collection year was the 1st year each had worked with the specific target students. Two of the paraprofessionals had received no postsecondary education, and two had obtained bachelor's degrees. The paraprofessionals and the students in this study are referred to by pseudonyms. Paraprofessionals are referred to as Adele, Barb, Carla, and Don and the student participants in this study are referred to as Alvin, Barry, Charles, and Dustin.

Student Participants. The student participants were four elementary students with severe disabilities who were supported by the paraprofessionals and who received the majority of their instruction (79% or more of the school day) in a general education setting. For the purposes of this study, the definition of a "severe disability" was taken from the Individuals with Disabilities Edu-

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cation Act (IDEA) of 1997, meaning that the study population included students with significant learning or cognitive impairments who were also likely to have other accompanying physical or sensory impairments. The existence of concomitant impairments and their impact on communication, mobility, generalization, and/or major life activities was independently verified through perusal of each student participant's individualized education program (IEP). Two of the students in the study were identified by the school district as having a primary disability label of autism; the other two were identified as having a primary disability label of cerebral palsy.

All four of the students in this study were male and enrolled in elementary school. Two of the students were African American and two were Caucasian. Additional information about each of the students' modes of communication and disabilities is provided to give context to the issues that interfere with peer interaction. At the time of the study, Alvin, who was 7 years old and in the second grade, had a vocabulary consisting of a

few words (e.g., yes, no, swing, play). Alvin would, occasionally, get up and walk out of the room. This behavior was attributed to boredom by his teachers. Barry, an 8-year-old second grader, was able to talk; however, he spoke in one to three word utterances and his speech was sometimes difficult to understand. When the study began, he knew over 50 words and concepts in sign language. When Barry was upset, he would sometimes yell or hit. Although he reportedly had never hit a peer, he frequently hit the paraprofessional who supported him. Charles, an 11-year-old fourth grader, spoke using one- or two-word utterances and a few signed words. When he was frustrated, he would breathe loudly or yell. Dustin, a 6-year-old kindergarten student, communicated very well verbally; however, he had some problems with voice volume and eye contact. Additionally, Dustin used a wheelchair for mobility and a specialized supportive chair while doing schoolwork.

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INTERVENTION

The intervention consisted of a 4-hour inservice training session held one-on-one with the participating paraprofessionals. The curriculum used in the individual training sessions was entitled "Supporting Students with Disabilities in Inclusive Schools" (Ghere, York-Barr, & Sommerness, 2002). Unit 7 of the training program was used, as it relates directly to the facilitation of interactions between students with and without disabilities. The first author conducted the individual training sessions, meeting with each paraprofessional at his or her place of employment for one session after school. Training consisted of four activities with the following objectives: (a) enhancing perspective, (b) establishing the importance of peer interaction, (c) clarifying the paraprofessional's role in facilitating interactions, and (d) increasing the paraprofessional's knowledge base of strategies for facilitating interactions. Each of these activities is described in more detail in the following.

Enhancing Perspective. Paraprofessionals were asked to complete a worksheet consisting of concentric circles (activity adapted from Forest, Pearpoint, & O'Brien, 1996). The paraprofessionals were asked to reflect on their own social relationships, indicating their own family and close friends in the innermost circle. Working outward through the circles, the paraprofessionals were then asked to write the names of good friends, the names of people they enjoyed doing things with occasionally, and last, the names of people who were paid to interact with them. The paraprofessionals were then directed to repeat this activity from the perspective of the target student with whom they worked. After they completed both sets of concentric circles, the paraprofessionals were prompted to compare the two resulting diagrams. The purpose of this activity was to enhance the perspective of the paraprofessional by providing a visual representation of the social relationships of the target student. In all four of the training sessions, the student circles generated by the paraprofessionals were virtually empty in the second and third tiers, but they were very full in the fourth, outermost circle (i.e., the tier indicating people who were paid to be with the student). By contrast, the circles of the paraprofessionals were much more balanced.

Establishing the Importance of Peer Interaction. In the second activity, the trainer recorded the responses while the paraprofessionals were asked "Why are social interactions and relationships important?" The paraprofessionals were then provided with information on this topic from the training manual (e.g., "Friendships meet our human need to belong and feel cared about", "Adults in schools can act as a bridge between students with and without disabilities", "Adults influence where, when, and how students spend time together"). As this information was shared, the paraprofessionals were prompted to add to their own statements about the importance of social interactions and relationships for students.

Clarifying the Paraprofessional's Role in Facilitating Interactions. This activity involved underscoring the paraprofessionals' responsibility to act as a bridge between the target student and his or her peers. The paraprofessionals were asked directly to think of ways they could facilitate inter-

actions between target students and their peers. The trainer recorded their responses for later use.

Increasing the Paraprofessional's Knowledge Base. During this activity, strategies for facilitating interaction were directly taught to the paraprofessionals. These strategies included modeling ways to interact, highlighting similarities between students, identifying strengths of the target student, directly teaching interaction skills, interpreting behaviors, and actively partnering students. Examples of each strategy (supplied in the training manual) were shared with the paraprofessionals. The paraprofessionals were then asked to add at least one of their own ideas to each list of strategy examples and then talked through the possible application of each strategy to their own employment situation. For a sample list of specific facilitative behaviors that were discussed in the training and later observed postintervention, see Figure 1. The first author concluded each training session by verbally summarizing the list of facilitation strategies generated in the third and fourth activity. Subsequent to each training session, the first author gave the typed list of compiled strategies to the participating paraprofessional and the general and special education teachers with whom he or she collaborated. The intervention did not include any additional follow-up feedback or rewards for the paraprofessional participants.

DATA COLLECTION PROCEDURES

The study was designed to evaluate the effectiveness of the intervention on both the facilitative behaviors of the paraprofessionals and the rates of interaction between the participating students and their peers during academic times. Paraprofessional facilitative behaviors were documented through observation using the Peer Interaction and Paraprofessional Facilitative Behavior Observation Instrument (PIOI). Student interaction data were also collected via the PIOI. The PIOI was adapted from the Educational Assessment of Social Interaction (EASI) Engagement Scale (Beckstead & Goetz, 1990), which was created to measure interactions between students with multiple and severe disabilities and their peers. Individual observational probes were 10 min in length. The PIOI was utilized to document the rate of the following occurrences: specific facilitative behaviors of the paraprofessionals, and recip-

rocal peer interactions between the participating students and other classmates.

For the purpose of this study, facilitative behaviors were defined as any purposeful behavior intended to cause the target student to interact with another student in the classroom. These behaviors could include (a) increasing physical proximity, (b) highlighting similarities, (c) teaching a skill directly, and (d) modeling and interpreting student behavior (Beckstead & Goetz, 1990). Peer interactions were defined as any two-way communication or any verbal or active nonverbal behavior that causes another person to have a verbal or nonverbal response. This could include (a) questioning, (b) gesturing, (c) nodding, (d) carrying out a direction, (e) physically or verbally re-

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sisting an initiation, (f) significantly changing expression or making intentional eye contact, and, (g) responding to or accepting physical support. If a second or further interaction was triggered by the first, those ensuing interactions were counted as separate instances rather than being considered the continuation of a chain of behavior. The PIOI allowed the observer to record each facilitative behavior and peer interaction that occurred during the set interval. Additionally, the instrument provided space for recording details about events or activities that might be pertinent to the data (e.g., student resting head on desk).

Before data collection commenced, the first author trained a second observer, a doctoral student in special education, in the use of the PIOI. Training continued until both observers simultaneously completed three consecutive 10-min observations with 100% agreement.

DESIGN

A multiple-baseline design across four paraprofessional-student pairs was utilized. Observational data were collected during academic times for

FIGURE 1
Examples of Facilitative Behaviors Displayed by Paraprofessionals Postintervention

Example Behaviors

- Increase target student's physical proximity to peers.
- Structure target student's "break time" to minimize removal from the classroom.
- Redirect verbal queries about the target student directly to the student.
- Fade assistance to allow more natural peer interaction opportunities.
- Partner target student with peers during academic tasks.
- Arrange for target student to use technology available in the classroom instead of in a separate setting.
- Verbally highlight similarities between target student and peers.
- Create communication cards focused on social exchanges for target student use.
- Integrate target student's home experiences into classroom conversations.
- Teach peers how to communicate with target student (e.g., selected ASL signs).
- Directly teach peers and target students how to interact with one another.
- Utilize interactive technology (e.g., computer with two input devices, tape player with two headsets).

  Utilize rewards that are interactive in nature (e.g., lunch with a friend, puzzle time with a peer).
- Give target student classroom responsibilities that encourage interaction (e.g., handing out papers).

Note. ASL - American Sign Language

each of the pairs over a 9-week period. Specifically, there was a 5-week period of ongoing data collection, a 4-week suspension of data collection, followed by two maintenance probes.

Baseline and Postintervention Phases. In order to establish the natural frequency of the target behaviors of interest, baseline data on paraprofessional facilitative behaviors and peer interactions were collected for a minimum of 3 observational days, or until stable baselines were established. Data were collected during consistent academic times in which the students in the classroom were expected to be learning new information or completing academic tasks and when interactions were appropriate. Observations were conducted three to eight times per week in each of the participating classrooms. Although the time of day that the observations took place varied because of the teachers' schedules, observations typically occurred sometime before lunch during the students' language arts block. After the intervention, data were continually collected until

the data trends were stable for all four pairs. Postintervention data collection procedures were identical to those utilized during baseline.

Maintenance Probe. Four weeks after the last postintervention probe was completed, two maintenance probes were conducted in each classroom. Because the design necessitated that the intervention dates were staggered, this meant that the maintenance probe was conducted 8 weeks after the intervention occurred for the first pair, 7 weeks after the intervention occurred for the second pair, 6 weeks after the intervention occurred for the third pair, and 5 weeks after the intervention for the fourth pair.

DATA DISPLAY AND EVALUATION

Data were charted by plotting the rate of facilitation by the paraprofessional and the rate of student interaction for each observational period. The charted data were then evaluated by visual inspection (Kazdin, 1982). Data in this study were analyzed by examining changes in mean,

level, and trend across the two phases (i.e., baseline and postintervention). Trend lines were created for each phase for each participant using the split-middle technique (White, 1972), and the percentage of nonoverlapping data between phases was calculated.

INTEROBSERVER AGREEMENT

Interobserver agreement checks were conducted during 18% (i.e., 24 out of 132) of the observational probes. These agreement checks were distributed equally across phases and participant pairs. During these checks, two observers independently collected data on each of the variables of interest and compared the data to determine to what extent the two data collectors agreed. A frequency ratio was calculated by comparing the total number of behaviors noted by the two observers. The smaller number was divided by the larger and multiplied by 100 (Kazdin, 1982). Over the 24 simultaneous observations, the rate of interobserver agreement was 100% for both variables of interest.

PROCEDURAL RELIABILITY

In this study, all training sessions with paraprofessionals were audio recorded. An independent rater listened to the taped sessions to test fidelity of treatment implementation by checking that all the steps in the training were completed during each session. Review of the procedural reliability data revealed that 100% of the treatment components were carried out during all four of the independent training sessions.

RESULTS

PARAPROFESSIONAL FACILITATIVE BEHAVIOR

Figure 2 presents the rates of facilitative behaviors per min for the four paraprofessional participants. Adele and Alvin are referred to as Pair #1, Barb and Barry as Pair #2, Carla and Charles as Pair #3, and Don and Dustin as Pair #4. As depicted in Figure 2, the rates of facilitative behaviors of the paraprofessionals increased slightly postintervention. During the baseline phase, the rates of

facilitative behaviors per min ranged from 0 to .1 facilitations across all four pairs. After the intervention, the rates of facilitative behaviors per min ranged from 0 to .7 across all four pairs. The change in range indicates that behavior after intervention became more variable. Overall, the paraprofessionals engaged in an average of two times more facilitative behaviors during the postintervention phase than during baseline. Although complete data categorizing the types of facilitative behaviors observed was not collected, anecdotal records indicated that partnering strategies most frequently yielded multiple interactions.

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behaviors were observed for Adele. However, during the postintervention phase, a rate of .14 (range 0 to .4) was recorded. Barb displayed an average rate of .04 facilitative behaviors per min during baseline (range 0 to .1) and an average of .29 (range 0 to .7) following the intervention. Carla did not display any facilitative behaviors during the baseline phase, whereas following the intervention, her average rate was .2 (range .1 to .4). Don's facilitative behavior average during baseline was .004 (range 0 to .1), whereas his average was .15 (range .0 to .3) following the intervention.

A maintenance probe administered 4 to 7 weeks after the completion of the postintervention phase reflected that each paraprofessional maintained his or her average level of facilitative behavior. Although the overall increase in facilitative behaviors was not dramatic, each of these maintenance probes demonstrated that the rate of facilitation remained at a level higher than the average baseline rate. Figure 2 graphically depicts the data generated from the maintenance probes.

Trend lines depict the tendency for data to indicate systematic increases or decreases over time (Kazdin, 1982). In this study, trends in data changed positively in slope for three of the four paraprofessional participants immediately after

Rate of Facilitative Behavior and Student Interaction Per Minute

Observational Probes
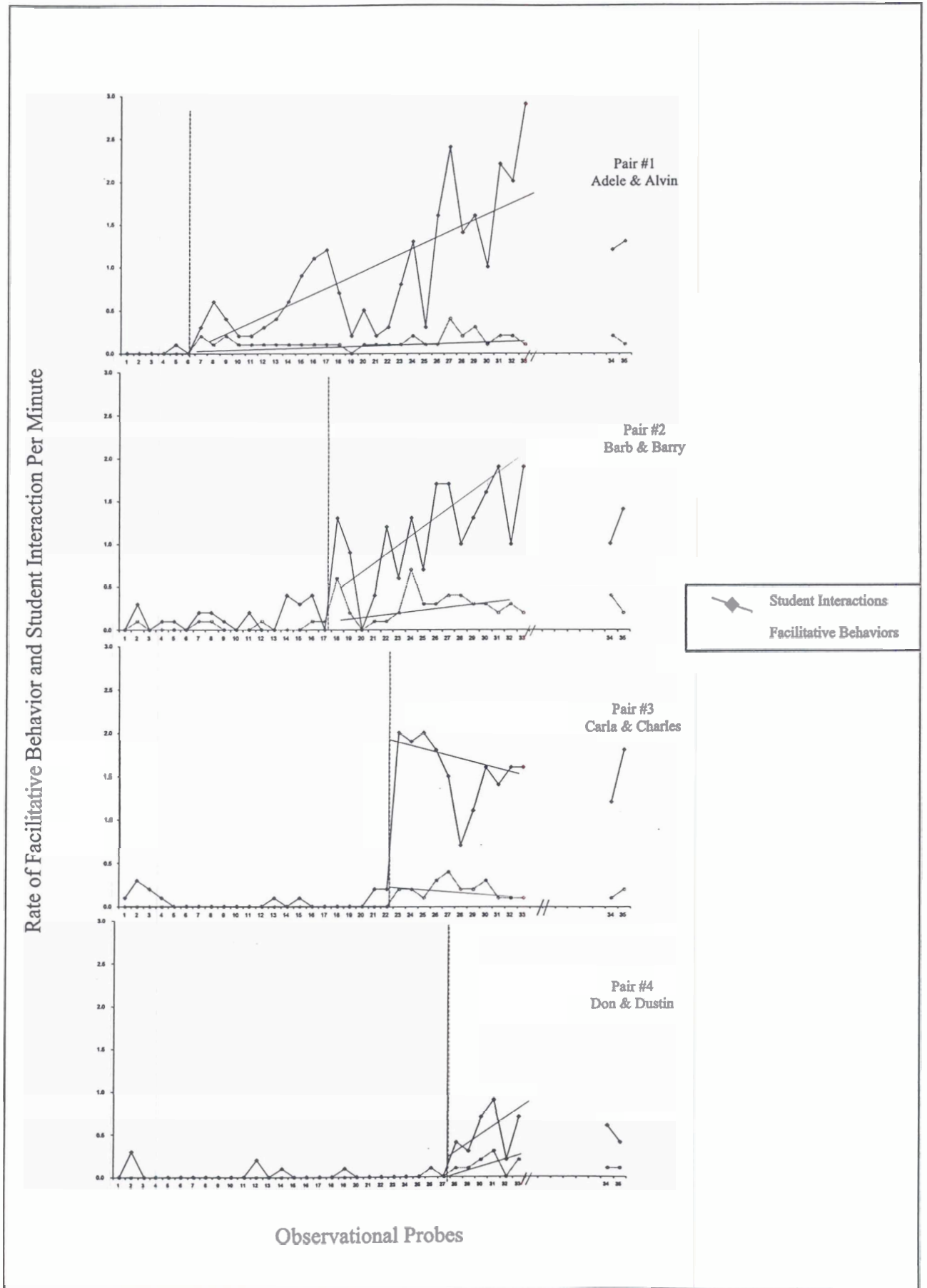
the intervention was employed. (See Figure 2 for postintervention phase trend lines; baseline phase trend lines for several participants either overlapped with or were just slightly above the x-axis and are therefore not depicted in the figure.) Examination of the trend lines indicated that each of the paraprofessionals increased their rate of facilitation following the intervention. For Carla, even though the trend line showed a deceleration, the overall rate of facilitation postintervention was much higher than would have been predicted from the baseline trend line. In addition, the maintenance probe for Carla showed a continued upward change.

The percentage of nonoverlapping data between phases was also calculated for each participant. For Adele, a full 96.6% of the postintervention data points were outside the range of baseline data. For Barb and Carla those percentages were 93.4 and 100 respectively. Postintervention data for Don showed a much lower percentage of nonoverlapping data, (i.e., 37.5%); however, it is important to note that four of the five overlapping postintervention data points comprised an overlap with the single non-zero baseline data point for this paraprofessional. The high percentages of nonoverlapping data (especially for Adele, Barb, and Carla), the immediate and obvious shifts in trend, and the overall increased levels of performance (i.e., paraprofessionals carrying out two times as many facilitative behaviors postintervention), combined to create convincing evidence of change in facilitative behavior as a result of the intervention.

STUDENT INTERACTION

Figure 2 also depicts the rate of interactions per min between each of the target students and their peers. In all cases, the rate of interaction between the target students and their peers increased when the intervention was employed. During the baseline phase, the rate of peer interactions for all four target students was very low, ranging from 0 to .4 interactions per min. During the postintervention phase of the study, the rate of interactions became much more variable, ranging from 0 to 2.9 per min. On average, the students interacted 25 times more frequently than during baseline.

During baseline, the rate of interaction for Alvin averaged .02 (range 0 to .1) per min, whereas during postintervention the rate of interaction averaged .95 (range .2 to 2.9) per min. Barry had an average interaction rate of .14 (range 0 to .4) during baseline, whereas following the intervention phase, his average interaction rate was 1.56 (range 0 to 1.9). Charles's interaction rate increased from an average of .06 (range 0 to .3) during baseline to 1.56 (range .7 to 2.0) during the postintervention phase. During baseline, the number of interactions for Dustin averaged .03 (range 0 to .3) per min; postintervention, Dustin's peer interactions averaged .53 (range .2 to .9) per min. Furthermore, maintenance probes taken 4 weeks after the last observational probes demonstrated that rates of student interaction remained relatively constant between the postintervention phase and the maintenance probes.

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Inspection of the trend lines (see Figure 2) for the student participants indicated that trends in the data changed positively in slope for three of the four students. For Charles, the trend line showed a slight deceleration; however, the change in mean for this participant was still noteworthy. The predicted visual continuation of trend lines from the baseline phases for all participating students indicated that low levels of interaction would have been expected if no intervention had been employed. However, in all cases, the intervention caused the anticipated trend of the data to change drastically for the student participants. Even though Charles showed a slight deceleration in his postintervention trend line, his trend line was still well above what would have been expected without intervention, and the percentage of nonoverlapping data postintervention was 100.

Percentage of nonoverlapping data points was also calculated for the other student participants. Like Charles, 100% of the postinterven-

tion data points were outside the range of Alvin's baseline range. For Barry and Dustin, the percentages of nonoverlapping data points were 88.9 and 75.0 respectively.

DISCUSSION

PARAPROFESSIONAL FACILITATIVE BEHAVIORS

Several prior investigators demonstrated that paraprofessionals can learn new skills and successfully implement new strategies after a relatively short training period (Hall, McClannahan, & Krantz, 1995; Shulka et al., 1999; Storey, Smith, & Strain, 1993; Wickham, 1993). The current study bolstered these findings and demonstrated that paraprofessionals can learn to facilitate interactions between students with and without disabilities after participating in a 4-hour inservice training.

In this study, all four paraprofessionals increased their rates of facilitative behaviors after the intervention was employed. For example, Adele and Carla did not attempt to engage the target students in any interactive exchanges with other students during any observational period during the baseline phase. During the postintervention phase, these same two paraprofessionals increased their average rates of facilitation quite substantially. These two paraprofessionals went from displaying no facilitative behaviors to engaging in one to two facilitations per 10 min probe on average. Another paraprofessional, Don, engaged in only one facilitative behavior during his very long baseline phase (i.e., 27 observational probes). After the intervention, he was observed employing more than one facilitative behavior on average during each observational probe.

It is important to note that the remaining paraprofessional, Barb, demonstrated a slightly different pattern of facilitative behavior during the baseline phase than the other three paraprofessionals. Baseline data indicated that she actually did facilitate some peer interactions before the intervention was employed. She was observed facilitating a total of six interactions for Barry during the 17 observational probes that were conducted during baseline. However, like the other paraprofessionals, she also increased her rate of facilitation from the baseline phase to postintervention—demonstrating that the training had a positive impact on a paraprofessional who demonstrated some level of proficiency, albeit limited, in facilitating interactions prior to the intervention. The change noted for Barb was the equivalent of going from an average of one facilitation every other observation, to almost three facilitations per 10 min observational period after the intervention. It is further important to note that Barb maintained the highest level of facilitation through the maintenance probes at the end of the study.

After the intervention, paraprofessionals engaged in two times as many facilitative behaviors as they did during baseline, resulting in natural and more frequent interactions between the target students and their peers. Additionally, paraprofessionals were then free to assist other students in the classroom while supervising the target student from a distance. Not only was this positive for other students in the classroom who received additional attention, it allowed for more natural peer interaction for the target student without an adult in the immediate vicinity.

STUDENT INTERACTION

Several studies have documented positive benefits to students with severe disabilities placed in inclusive versus self-contained settings, including more interaction with peers without disabilities, IEP objectives related to social relationships, and higher levels of social support from peers (Fryxell

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& Kennedy, 1995; Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994). Although the student participants in this study were most likely experiencing more interaction with their peers without disabilities than they would have experienced had they been served in segregated settings, they were still socially isolated during baseline. Although each target student had an IEP goal re-

lated to social interaction, the paraprofessionals did very little to facilitate interactions during the baseline phase.

An important finding in this study was that a relatively small change in paraprofessional behavior yielded a substantial increase in student interaction. In many cases, one facilitative behavior resulted in numerous interactive exchanges between the target student and other students in the classroom. For instance, Carla, one of the paraprofessionals, directed Charles to select a friend to read with him—an example of a partnering strategy presented in the paraprofessional training. The verbal directive was coded as one facilitative behavior. After this prompt, Charles selected a friend and sat down with her. Following Charles's selection, 14 interactive exchanges occurred over the next 5 min between Charles and his classmate.

In another example, Barb (a paraprofessional) and Barry were working together on a math assignment. When they finished, Barb noticed that another student in the classroom had also finished. Barb took that opportunity to utilize two facilitative strategies from the training. First, she highlighted the similarities between the two students by pointing out that they had both completed the same math worksheet. Second, she utilized a partnering strategy by suggesting that they check their answers together with a calculator. As they worked together with the calculator, 19 peer interactions took place.

Perhaps the most important result of this study was the dramatic and immediate change in the interaction levels observed between the target students and their peers. For all four student participants, rates of interaction prior to the intervention were extremely low. During the 10-min observational probes conducted during baseline, no target student engaged in more than four interactions. In fact, during baseline, the target students were not typically interacting with anyone at all. Of the 72 baseline probes, 61 (84%) reflected interaction rates of 0 or .1. This means that during 84% of the baseline probes, the target student was either not interacting at all, or engaged in the equivalent of one interaction over a 10-min period. This is drastically different than the interaction rates of students without disabilities in the same classrooms. These data show that the mere placement of students with disabilities in general education classrooms does not ensure meaningful levels of interaction between students with and without disabilities. Our findings underscore Evans et al.'s (1992) assessment that someone within the school environment needs to facilitate and support the social inclusion of students within the classroom in order for that inclusion to be successful.

As a result of the paraprofessional training, the interaction rates of the student participants began to approach the interaction rates of their peers. Peer interaction rates postintervention increased an impressive 25-fold. Additionally, though we did not attempt to record the valence of interactions observed, anecdotal notes recorded during observations suggest that only one interaction could have been considered negative. In that particular interaction, which occurred during baseline, a student took a ball from one of the target students, and the target student responded by shouting "No."

The current study also supported Evans et al.'s (1992) findings in that when the paraprofessionals were trained to help students increase their interaction rates with peers, those rates did increase. Although the changes in paraprofessional facilitative behavior were not of the same magnitude as the changes in peer interaction, the changes in facilitative behavior and peer interaction occurred simultaneously and in conjunction with the intervention. The clear timing of the changes between the staggered phases makes us confident that facilitative behaviors learned in training made real changes in the classroom experiences of the participating students, with those students being much more meaningfully included in the classroom with their peers.

SOCIAL VALIDITY

Whereas data concerning the social validity of the intervention were not formally collected, it is important to note that the parent of one student participant did independently contact the first author to let her know that she believed the intervention—and ensuing increases in social interaction and acceptance—had already made the classroom a more positive place for her son. She indicated that following the intervention, her son had twice been invited to play outside of school by classmates—his first such invitations of

the school year. Participating teachers and para-professionals also offered unsolicited testimonials about the strides they felt were made by the student participants in terms of the overall quality of their daily experiences in the classroom.

LIMITATIONS

We acknowledge the existence of several limitations to our findings. Although the data we collected did show an increase in paraprofessional facilitative behavior after the intervention, that increase was modest. Our hypothesis is that these modest changes in adult behavior yielded notable changes in levels of student interaction. However, it is also possible that additional changes in paraprofessional behavior occurred that our data collection instrument was not sensitive enough to detect. An instrument focused on more subtle or qualitative changes in behavior or on a wider range of behavior might have yielded different results and should be considered in future studies of facilitative behavior.

The intervention package was multifaceted, addressing both attitudes and perceptions about the importance of interactions, as well as specific skills to facilitate those interactions. Another limitation to our findings is that the observation instrument measured global changes in facilitative behavior only. Additional measures would be needed to capture changes related to all of the intervention components. We cannot assess at this time which parts of the training were most effective. Future research structured as a component analysis would allow the most effective combination of training package elements to be highlighted.

One other limitation to our findings is that data were only collected during academic periods. We know, however, that interaction during nonacademic times is also critical to the academic and social success of students with severe disabilities. Future research should focus on a wider range of settings.

> *Without proper training, paraprofessionals can act in ways that unwittingly isolate and segregate the students whom they support.*

IMPLICATIONS FOR PRACTICE

The most common response to the increasing numbers of students with high levels of need being served in inclusive settings is to hire paraprofessionals to support those students. The results of the current study show that this arrangement should be implemented with care. We recommend that when a paraprofessional is hired to support a specific student, he or she should be provided training, such as the intervention used in this study, to facilitate peer interactions.

Without proper training, paraprofessionals can act in ways that unwittingly isolate and segregate the students whom they support. This lack of adequate training has serious implications for the lives of students with disabilities, because interaction is essential to establish feelings of belonging (Kunc, 2000; Maslow, 1970); self-esteem (Baumeister & Leary, 1995; Branthwaite, 1985; Nave, 1990); and improved academic success (Johnson, 1981; Marr, 1997; Yager et al., 1985). The absence of interaction between the target students and their peers during the baseline phase of this study was consistent with other research documenting the negative effects of the use of paraprofessionals. Fortunately, these negative effects were diminished after the training was employed.

This study demonstrated that a relatively short and low-cost paraprofessional training program could provide an immediate and potentially long-lasting positive impact on the interaction rates of students with severe disabilities in inclusive classrooms. In the future, this research should be expanded to other populations of students with disabilities who also have difficulties with peer interaction. In addition to our earlier recommendation that the utility of the specific components of the training package be analyzed, we also recommend that the training program be implemented on a wider scale to assess its broader functional utility and cost-effectiveness for professional development purposes. The results of this study and further research in this area can be used to facilitate the appropriate and supported inclusion of students with disabilities in general education classrooms so that their full academic and social potential can be reached.

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