Training Paraeducators to Promote the Use of Augmentative and Alternative Communication by Students with Significant Disabilities

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Abstract: The purpose of this study was to determine the impact of training paraeducators on (a) paraeducator prompting use of augmentative communication (AAC) systems, (b) paraeducator responding to student requests, (c) student use of AAC, and (d) student problem behavior via a series of multiple probe designs. Participants were three paraeducators and students. Paraeducators were trained on (a) importance of communication, (b) relationship between behavior and communication, (c) use of AAC, (d) how to prompt students to use AAC and respond to communications, and (e) how to self evaluate their behavior. All paraeducators increased the number of times they prompted student use of AAC and responded to student requests. All students increased use of AAC and exhibited fewer problem behaviors.

All people communicate in order to express their wants and needs. In fact, the ability to communicate in meaningful and acceptable ways is fundamental to participation in our society (Drasgo & Halle, 1996; Kaiser & Grim, 2006). Students with significant disabilities almost always have limitations in their receptive and expressive language skills (McLean, Brady, & McLean, 1996; Siegel & Wetherby, 2006; Sigafoos & Pennell, 1995). They may have difficulty understanding spoken language as well as expressing their wants and needs. An inability to communicate with others presents serious problems for students with significant disabilities including the use of problem behaviors as communicators. Problem behaviors may take the form of tantrums, self-injury, aggression toward others, and property destruction (Day, Horner, & O'Neill, 1994; Dunlap, Ferro, & dePerczel, 1994; Durand, 1990; Ferro, Foster-Johnson, & Dunlap, 1996; Horner, Albin, Todd, & Sprague, 2006; Repp, Felce, & Barton, 1988).

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Students with challenging behaviors are likely to be excluded from general education programs and social activities. If children with significant disabilities are to grow up and hold meaningful jobs in the community, take part in leisure events and activities with the general public, and live as independently as possible, they need to communicate effectively with other people in all these environments (Sack & McLean, 1997).

The inability to communicate and challenging behaviors also interfere with students' ability to be included in regular education programs, to participate in social activities, and to lead full, productive lives. Teachers and paraeducators who support these students need strategies for promoting appropriate communication and decreasing occurrences of problem behaviors.

Bird, Dores, Moniz, and Robinson (1989), Carr and Durand (1985), Durand and Carr (1991), Horner and Budd (1985), and Wacker et al. (1990) suggest that functional communication training and the use of augmentative and alternative communication benefit students with communication deficits who exhibit challenging behaviors. On the other hand, many teachers and paraeducators supporting students with significant disabilities face challenges when implementing these practices (Johnston, Reichle, & Evans, 2004).

For example, some students (a) have AAC systems but are not using them, (b) have AAC systems but their communicative partners are not using them, or (c) use alternative, but socially inappropriate strategies for communication. Additionally, some students have learned that behaviors such as tantrums gain attention more quickly than pointing to a symbol. Students may not have the opportunity to use AAC systems due to limited interactions with others and lack of understanding on how to use the systems. Children with severe disabilities who use AAC systems experience difficulties in their daily interactions (Light, 1988) and often have few opportunities to communicate with others (Calculator & Luchko, 1983). Moreover, some adults who interact with these students do not understand the importance of communication in controlling behavior. If significant others cannot understand efforts to communicate, they may not be able to respond appropriately, which results in increases in problem behaviors (Durand, 1990; Keen, Sigafoos, & Woodyatt, 2001; Reichle, 1997).

Education and support of students with significant disabilities is often the responsibility of paraeducators. Many paraeducators feel unprepared to meet the needs of these students (Giangreco, 2003). As a result, the need for investigations to determine effective interventions for paraeducators is critical. In order for paraeducators to support student use of AAC, they must fully understand the relationship between behavior and communication (Durand, 1999).

The roles of paraeducators providing supports to children with disabilities have changed significantly from being teacher aides who provide clerical assistance to being support personnel in the areas of instruction, tutoring, and management of classroom behavior (Harrington & Mitchelson, 1986; Jones & Bender, 1993; Pickett, 1997). Paraeducators are now providing direct services to students including behavior management, implementing and evaluating treatment and intervention programs, and instruction (French & Cabell, 1993). A critical consideration is the level of staff training, given that paraeducators are typically responsible for ensuring that students with disabilities have access to and are able to effectively utilize AAC devices (Butter-

field & Arthur, 1995). Unless properly trained, paraeducators may disregard communicative actions of students who use AAC devices (Calculator & Jorgensen, 1991). When students' communicative attempts are ignored, increases in problem behaviors occur (Durand, 1999; Lalli, Casey, & Kates, 1995).

Paraeducators provide much needed supports and are critical to student success. The literature suggests that many paraeducators continue to be undertrained or untrained (Giangreco, 2003) and are often assigned to work with students who have the most complex learning or behavioral challenges (Giangreco, Edelman, & Broer, 2001). Paraeducators continue to engage in a broad range of roles, many of which they are untrained or insufficiently trained to perform (Blalock, 1991; French & Pickett, 1997). Training paraeducators in communication use may increase student use of AAC and reduce aberrant behavior. Yet paraeducators who support these students in special education and general education classrooms often do not receive appropriate training on how to implement AAC.

As more students with significant disabilities are included in general education classrooms, the need for additional training for paraeducators is evident. Training staff using a treatment package that includes self-evaluation may increase the likelihood of success for students with significant disabilities. The purpose of this study was to determine if training paraeducators using a treatment package including self-evaluation results in increased prompting of student use of augmentative communication devices and increased responding to student attempts to communicate.

Method

Participants and Settings

Staff (paraeducators). Three paraeducators who support students who have (a) severe/profound or multiple disabilities, (b) use augmentative communication systems to communicate, and (c) exhibit problem behaviors participated in this study. These paraeducators worked in self-contained classrooms operated by a community agency under a contrac-

TABLE 1

Characteristics of Staff

Paraeducators	Age	Gender	Time Employed	Level of Education
Paraeducator 1	20	F	2.5 months	High School Diploma
Paraeducator 2	52	F	5 years, 5 months	GED
Paraeducator 3	23	F	3 years, 5 months	High School Diploma

tual arrangement with a large urban school district.

Letters describing the study and inviting participation were sent to paraeducators. Paraeducators volunteered to participate in the study by returning a letter of informed consent. Three paraeducators were randomly selected from the group of 18 paraeducators who returned letters (see Table 1).

Students. Three students who attended the classrooms of the paraeducators who were randomly selected participated in the study. Students selected had (a) a diagnosis of severe/profound or multiple disability, (b) a history of challenging behavior (e.g., aggression, self-injury, property destruction) as determined by teacher report, individualized education plan (IEP), and behavioral intervention plan, (c) a functional behavioral assessment in place, and (d) an augmentative or alternative communication (AAC) system for communicating (e.g., picture boards, pictures or symbols, objects, or voice output devices). Student characteristics information is presented in Table 2.

The researcher met with the administrator of the community program to identify students who met the inclusion criteria. Prior to the meeting, the administrator and researcher gathered information based on teacher re-

port, student records including IEP's, functional behavioral assessments, behavioral intervention plans, and classroom observations.

Setting

Paraeducators received training in an agency staff development classroom. The classroom measured 30 x 30 feet and was equipped with 10 tables and 40 chairs; a TV and VCR, a video camera, a dry erase board, and other training materials (e.g., videos, flip charts, training modules).

The study took place in each student's classroom and school environment. Classrooms measured approximately 60 x 60 feet and were self-contained within elementary, middle, and high schools. Classes had six to eight students, one teacher, and one or two paraeducators. School environments included areas such as the lunchroom, media center, gym, and playground.

Experimental Design

A multiple probe across paraeducator design was used to evaluate the effectiveness of the intervention (training using a treatment package including self-evaluation). Paraeducators

TABLE 2

Characteristics of Students

Student	Age	Gender	Disability	Type of AAC	Behaviors Exhibited
Student 1	16	F	S/P	Picture Symbols	Aggression Self-Injury
Student 2	8	M	MU	Picture Symbols	Property Destruction Self-Injury
Student 3	12	F	MU	Picture Symbols Big Macs	Aggression Disruption

were initially assessed to determine baseline levels of behavior. Baseline continued until student responding was stable for at least three days. The first paraeducator was then trained using the treatment package including self-evaluation. Once a change in responding was noted for the first paraeducator, the second was trained; and similarly, the third began training once the second showed a change.

Procedure

Baseline. Student performance data were collected for three hours between the hours of 9:00 A.M. and 12:00 P.M. (noon) on each paraeducator for a minimum of three days to establish baseline performance. Observers utilized data collection instruments to record time, problem behavior, attempts to communicate using AAC, prompts, and responses. During baseline, nothing in the classroom was altered except that the observer was present in the classroom. Paraeducators knew that the observer was interested in communication, but were naïve about the intensions of the study and what behaviors were being observed. The fact that the paraeducators were not knowledgeable about the premise of the investigation helped control for the potentially confounding variable of reactivity to observer presence (e.g., Hay, Nelson, & Hay, 1980; White, 1977).

Intervention: Training on AAC and self-monitoring. Paraeducators were trained (a) on the importance of communication, (b) the relationship between behavior and communication, (c) the use of AAC, (d) how to prompt students to use AAC, (e) how and when to respond to students' communicative attempts, and (f) how to self-evaluate their own behavior. One two hour session was held with each paraeducator in which the components of behavior, communication, prompting, and self-evaluation were taught.

During the first half of the training, paraeducators were provided with a summary of intervention research on communication and its importance for students who have significant disabilities (e.g., the impact that communication has on students' lives including outcomes of holding meaningful jobs in the community, taking part in leisure events and activities with the general public, and living as independently as possible (Sack & McLean, 1997). The relationship between behavior and communication was discussed (Carr & Durand, 1985).

During the second half of the training, paraeducators were introduced to AAC. Training focused on the definition of AAC and the types of AAC that students use to communicate (picture boards, pictures, symbols, voice output devices, or other assistive communication devices).

Through role-playing, paraeducators learned how to prompt students to use AAC systems (e.g., verbal, gestures, and physical prompts). Paraeducators were instructed to prompt student use of AAC immediately when the student attempted to communicate. The researcher modeled appropriate prompting strategies including (a) verbal prompts, (b) gestures, and (c) physical prompts. Prompts were defined as assisting the student to communicate with AAC using least to most prompting (verbal, gestures, physical). Paraeducators were instructed to prompt students to use AAC each time that student attempted to communicate using AAC or to communicate through problem behavior (e.g., hitting, biting, and yelling). Paraeducators role played prompting the use of AAC and were given feedback until they were able to achieve 100% accuracy. The training lasted for three hours.

Paraeducators were trained through modeling and role-playing to respond to student attempts to communicate. Examples of AAC systems (e.g., big mac switches, voice output devices, communication boards) were used to demonstrate how students communicate using the systems. The researcher modeled how to respond immediately to requests. Responses were defined as reacting within three seconds to student requests in a manner consistent with the communicative intent of the request (i.e., presenting student with requested object or activity). Paraeducators role-played responses to requests until 100% accuracy was achieved. The role-playing lasted for three hours.

Paraeducators were then trained on how to self-evaluate their own behavior. They were instructed to count the number of times they prompted or responded to communication and to record this information on a data

sheet. The researcher checked for staff mastery of the procedure through use of a video exercise. The paraeducators viewed videos of themselves taped during baseline. They were instructed to record the number of times they observed themselves prompting student use of AAC or responding to student requests. Through the use of videotape, this data was compared to the data collected by the observer during baseline. A criterion of 100% accuracy was required for mastery. Paraeducators were retrained and repeated the video exercise until criterion was met. The sessions lasted for one hour and all paraeducators achieved 100% accuracy after repeating the exercise one time.

Paraeducators then implemented the training in their classrooms. They prompted students to use their AAC system each time they attempted to communicate. Prompts were defined as assisting the student to communicate with AAC using least to most prompting (verbal, gestures, physical). The paraeducators recorded each time they prompted students to use AAC on a data sheet.

Paraeducators then responded immediately to student requests. Responses were defined as reacting within three seconds to student requests in a manner consistent with the communicative intent of the request (presenting student with requested object or activity). The paraeducators recorded each time they responded to student requests on a data sheet.

Interobserver Agreement

Interobserver agreement was recorded based on the total number of occurrences of the behaviors. The mean interobserver agreement for paraeducator prompting was 92% (88 % – 100%). The mean interobserver agreement for paraeducator responding was 96% (88% - 100%). The mean interobserver agreement for student use of AAC was 100% (100% - 100%). The mean interobserver agreement for student problem behavior was 91% (86% - 100%). Reliability on the researcher's data sheets and the observer's data sheets was calculated by recording the number of agreements and disagreements, then multiplying by 100% (Cooper, Heron & Heward, 1987).

Procedural fidelity was determined by comparing the paraeducators' self-evaluation data

sheets to the observers' data sheets. The mean score for paraeducator 1 for prompting was 92% (88% - 100%). The mean score for paraeducator 1 for responding was 97% (92% - 100%). The mean score for paraeducator 2 for prompting was 93% (90% - 100%). The mean score for paraeducator 2 for responding was 91% (88% - 100%). The mean score for paraeducator 3 for prompting was 94% (90% - 100%). The mean score for paraeducator 3 for responding was 94% (90% - 100%).

Results

Data are presented for both paraeducator behavior (prompting student use of AAC and response to student requests) and student behavior (AAC use and problem behavior) for three conditions: baseline, intervention, and maintenance. As can be see in Figures 1 and 2, paraeducators behavior is recorded and analyzed via a multiple probe across participants design. Similarly, student behavior is presented in Figures 3 and 4.

Paraeducator Behavior

Prompt student use of AAC. The data collected in the baseline condition showed that Paraeducator 1 did not prompt the student to use AAC. After receiving the training, Paraeducator 1 immediately began prompting the student to use AAC. During baseline the mean number of prompts for student use of AAC was 0. After the intervention was implemented on day 4, the mean number of prompts for student use of AAC was 11 with a range of 7-16 prompts. During maintenance, Paraeducator 1 prompted student use of AAC 15 times on day 25 and 16 times on day 29.

Data collected in the baseline condition showed that Paraeducator 2 prompted the student to use AAC two or less times per session. After receiving the training, Paraeducator 2 immediately increased the number of prompts per session. During baseline the mean score for prompting student use of AAC was one time per session with a range of 0-2 prompts. After training the mean score for prompting student use of AAC was 13 with a range of 10-17 prompts. During maintenance, Paraeducator 2 prompted student use of AAC 16 times on day 29.

Data collected in the baseline condition showed that Paraeducator 3 did not prompt the student to use AAC. After receiving the training, Paraeducator 3 immediately began prompting the student to use AAC. During baseline the mean score for prompting student use of AAC was 0. After training the mean score for prompting student use of AAC was 7 with a range of 4-14 prompts. During maintenance, Paraeducator 3 prompted student use of AAC 14 times on day 29 and 15 times on day 31 (see Figure 1).

Respond to student requests. Data collected in the baseline condition showed that Paraeducator 1 did not respond to student requests. After the introduction of the intervention, Paraeducator 1 immediately began responding to student requests. During baseline the mean score for responding to student requests was 0. After the intervention was introduced on day 4, the mean score for responding to student requests was 10 with a range of 3-16 responses. During maintenance, Paraeducator 1 responded to student requests 15 times on day 25 and 15 times on day 29.

Data collected in the baseline condition showed that Paraeducator 2 did not respond to student requests. After introduction of the intervention on day 9, Paraeducator 2 immediately began responding to student requests. During baseline the mean score for responding to student requests was 0. After training the mean score for responding to student requests was 10 with a range of 5-15 responses. During maintenance, Paraeducator 2 responded to student requests 17 times on day 29.

Data collected in the baseline condition showed that Paraeducator 3 responded to student requests less than 1 time per session. After receiving the training, Paraeducator 3 immediately began responding to student requests. During baseline the mean score for responding to student requests was .2 with a range of 0-1 responses. After training the mean score for responding to student requests was 9 with a range of 5-16 responses. During maintenance, Paraeducator 3 responded to student requests 15 times on day 29 and 16 times on day 31 (see Figure 2).

Student Behavior

Use of AAC. Data collected in the baseline condition showed that Student 1 did not attempt to use AAC independently. After the paraeducator received training, Student 1 did attempt to use AAC during several sessions. During baseline the mean score for use of AAC was 0. After training the mean score for use of AAC was .5 with a range of 0-2 attempts. During maintenance, Student 1 attempted to use AAC 2 times on day 25 and 2 times on day 29 (see Figure 3).

Data collected in the baseline condition showed that Student 2 attempted to use AAC less than 1 time per session. After the paraeducator received training, Student 2 increased attempts to use AAC. During baseline the mean score for use of AAC was 0. After training the mean score for use of AAC was 4.5 with a range of 2-7 attempts. During maintenance, Student 2 attempted to use AAC 8 times on day 29.

Data collected in the baseline condition showed that Student 3 did not attempt to use AAC independently. After the paraeducator received training, Student 3 began to use AAC. During baseline the means score for use of AAC was 0 with a range of 0-0 attempts. After training the mean score for use of AAC was 5 with a range of 4-9 attempts. During maintenance, Student 3 attempted to use AAC 6 times on day 29 and 8 times on day 31 (see Figure 3).

Problem behavior. Data collected in the baseline condition showed that Student 1 exhibited a high level of problem behaviors. After the paraeducator received training occurrences of problem behavior decreased. During baseline the mean score for problem behavior was 10 with a range of 8-11 behaviors. After training the mean score for problem behavior was 2 with a range of 0-6 behaviors. During maintenance, Student 1 exhibited 3 problem behaviors on day 25 and 1 problem behavior on day 29. The data collected in the baseline condition showed that Student 2 exhibited a high level of problem behaviors. After the paraeducator received training occurrences of problem behavior decreased. During baseline the mean score for problem behavior was 11 with a range of 8-16 behaviors. After training the mean score for problem
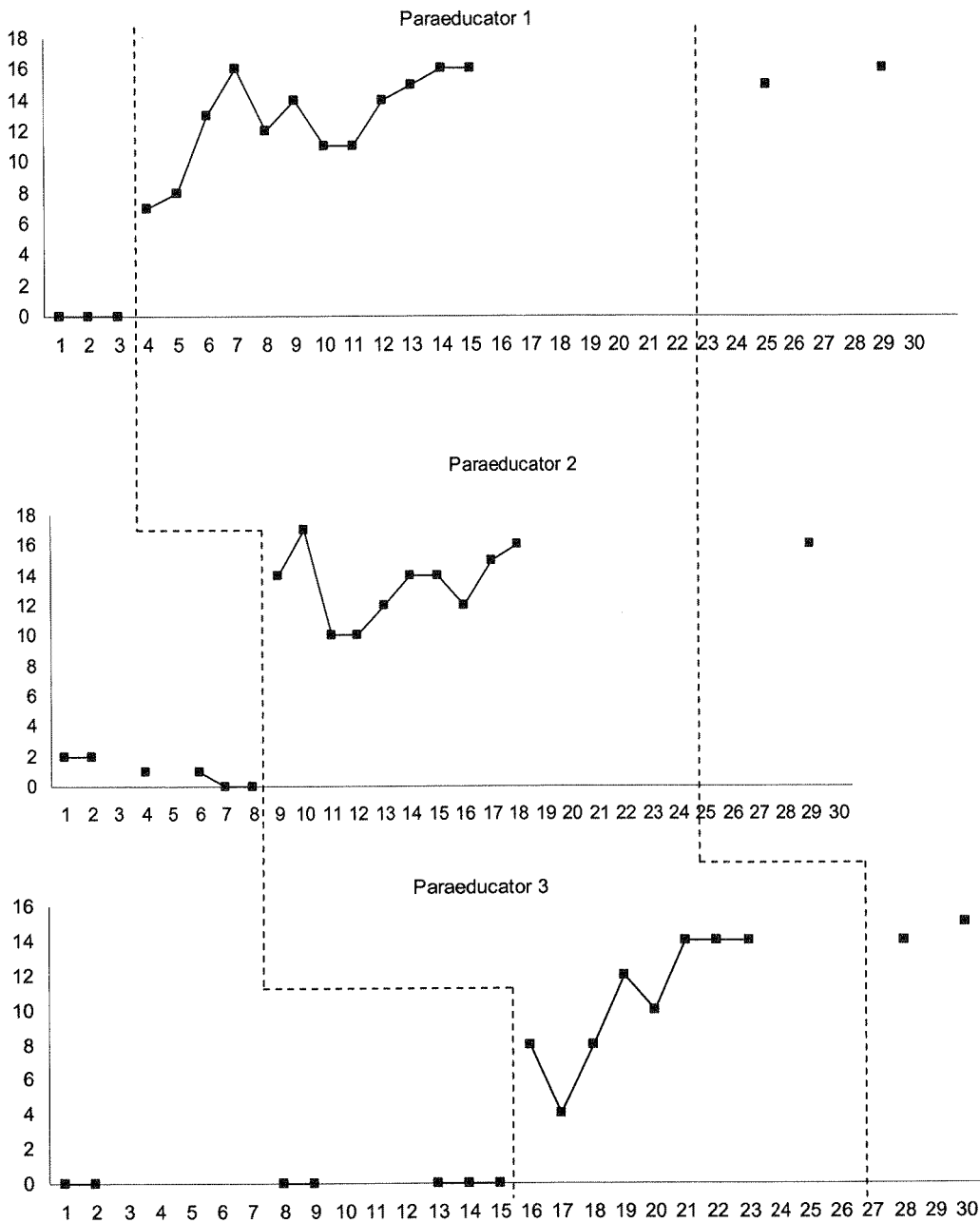
Figure 1. Number of times paraeducators prompted students to use AAC across paraeducators 1, 2, and 3.

behavior was 5 with a range of 3-9 behaviors. During maintenance, Student 2 exhibited four problem behaviors on day 29 (see Figure 4).

Data collected in the baseline condition showed that Student 3 exhibited a moderate level of problem behaviors. After the paraeducator received training occurrences of problem behavior decreased. During baseline the mean score for problem behavior was 4 with a range of 3-4 behaviors. After training the mean score for problem behavior was 1 with a
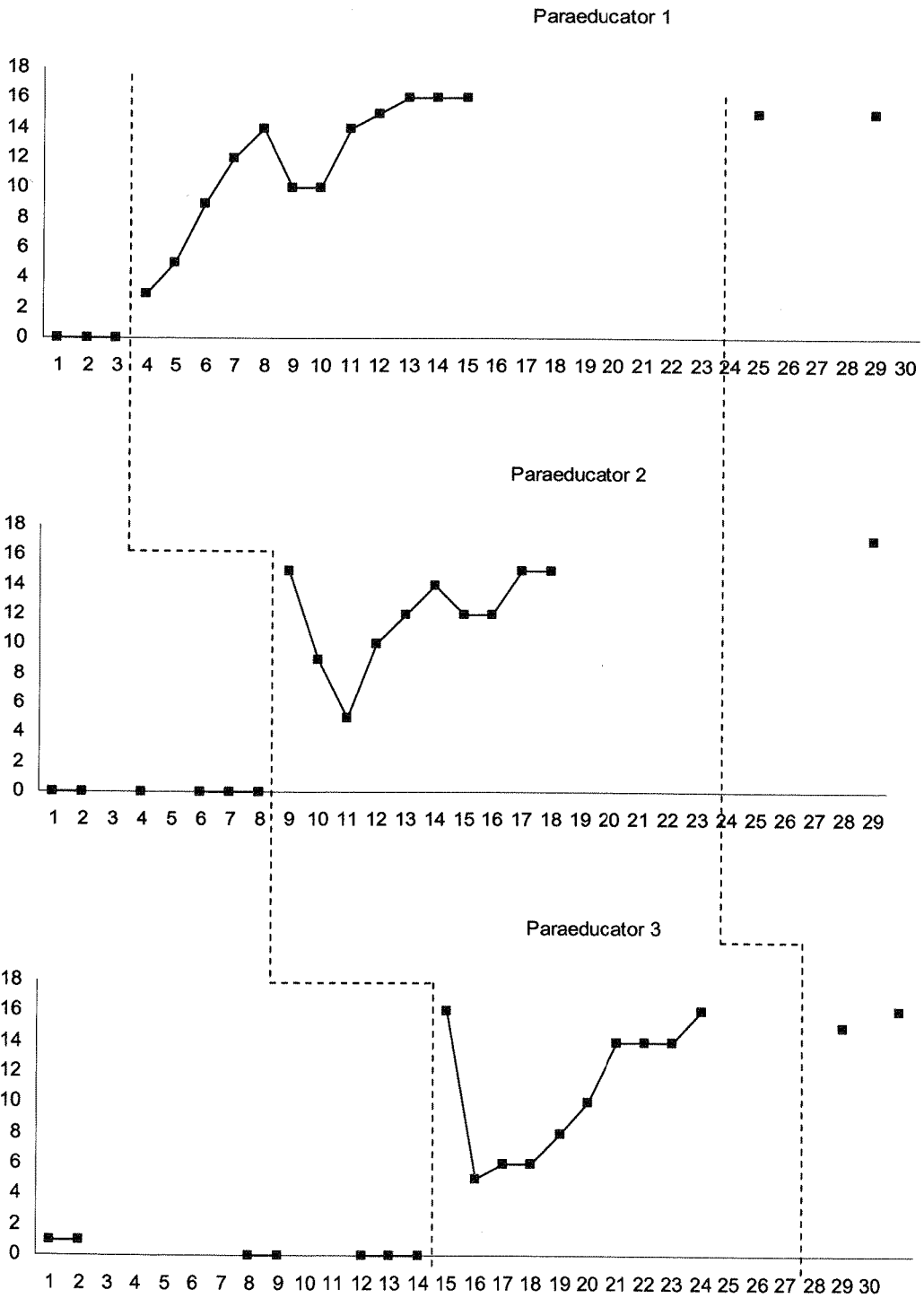
Figure 2. Number of times paraeducators responded to students requests across paraeducators 1, 2, and 3.
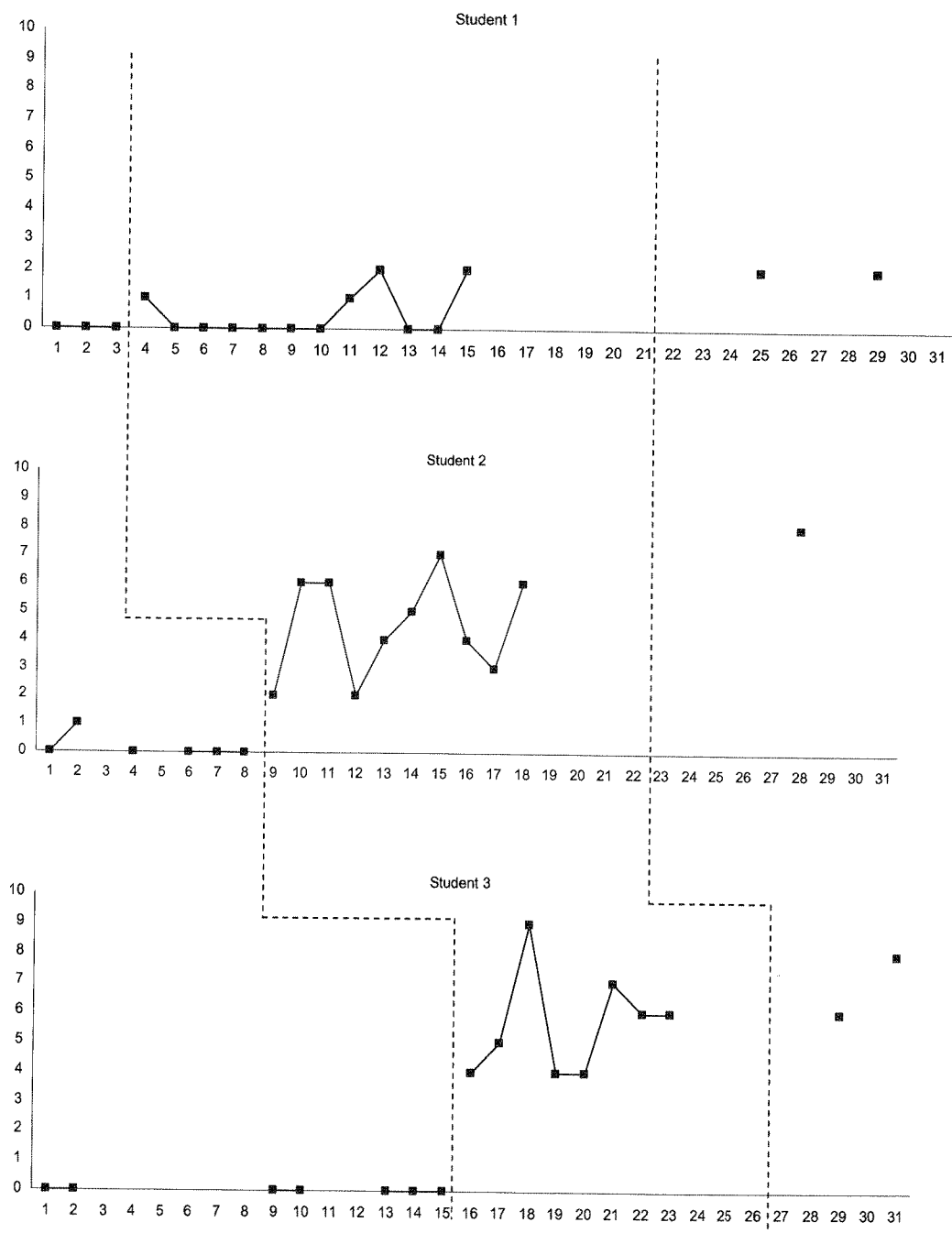
Figure 3. Number of times students used their AAC devices across students 1, 2, and 3.

range of 0-4 behaviors. During maintenance, Student 3 exhibited 2 problem behaviors on day 29 and 1 problem behavior on day 31 (see Figure 4).

Discussion

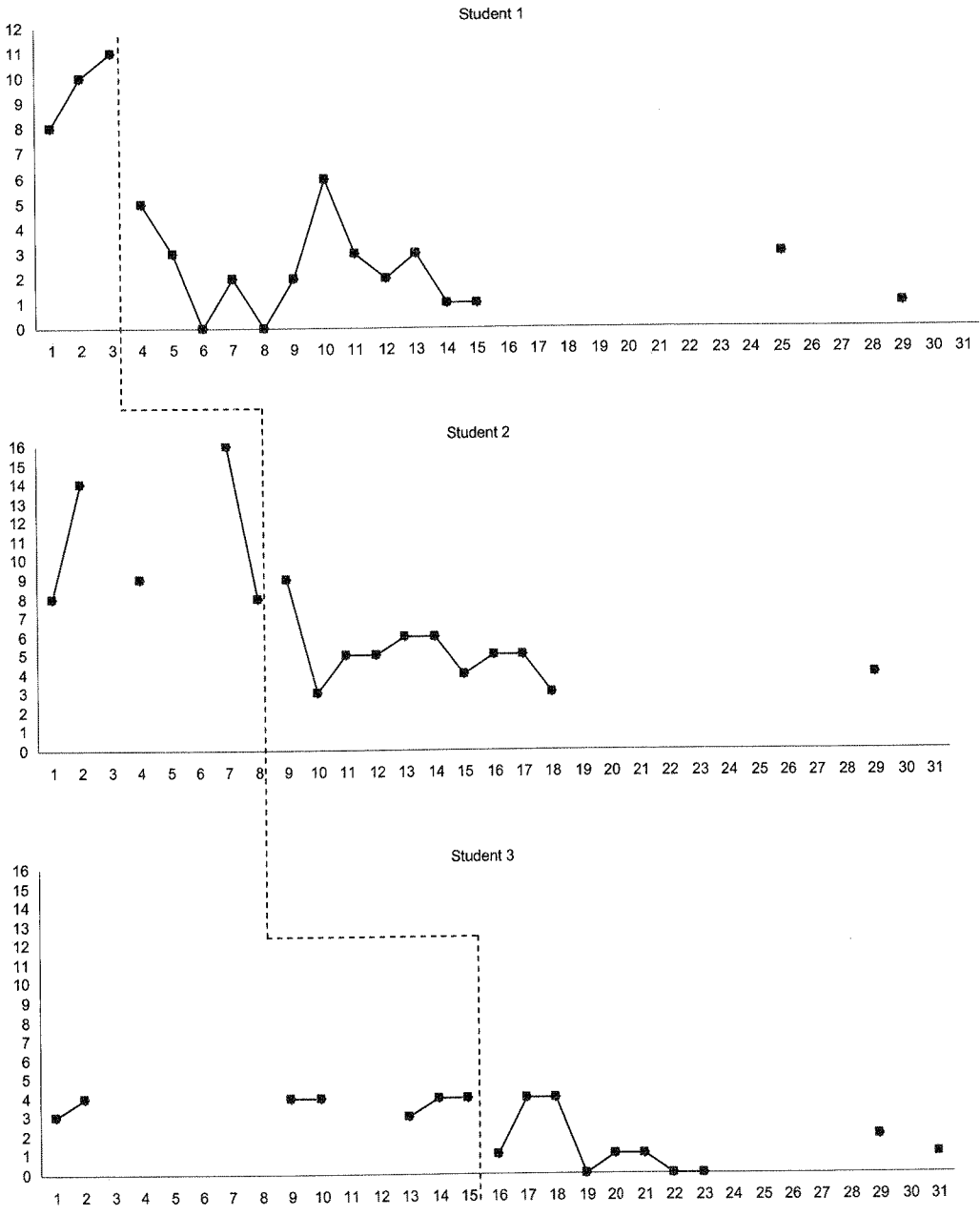The overarching outcomes of this investigation indicated that all three paraeducators in-

Figure 4. Number of occurrences of student problem behavior across students 1, 2, and 3.

creased the number of times that they prompted the use of augmentative communication systems and the number of times they responded to student requests. The primary finding was that the training of paraeducators using a treatment package including self-evaluation increased the number of times they prompted students to use AAC and the number of times they responded to student requests. All three paraeducators demonstrated immediate and dramatic change in behavior after receiving training. The paraeducators went from prompting the use of augmentative and alternative communication (AAC) two or

less times during baseline to prompting the use of AAC an average of nine times per session. Responses to student requests increased from less than one time to an average of nine times per session.

Augmentative and alternative communication has become a method of choice to facilitate language and to address challenging behavior (Mirenda & Erickson, 2000). Variables related to the efficiency of AAC include: (a) time to introduce and get different parties up and going with AAC system, (b) time that lapses before an individual is able to use AAC to accomplish predetermined needs and purposes, (c) extent to which use of an AAC system complements other methods used by the individual to communicate, and (d) time necessary to solicit contingent responses from partners with and without AAC (Calculator, 1999).

Johnston et al. (2004) identified the need for methods to train educators to promote the use of AAC in the classroom. They suggested that students have AAC systems but are not using them and that their communicative partners are not using them. They also suggested that students use alternative, but socially inappropriate, strategies for communication. The present study strengthened this finding in the following ways. Although all three students who participated in this study had AAC systems in place, the paraeducators did not consistently prompt students to use the systems prior to intervention. Without this prompting, students seldom used AAC devices and relied instead on problem behaviors in order to communicate. Further, paraeducators responded more often to student requests when the students communicated through problem behaviors than when students attempted to use AAC to make requests.

Paraeducator Training

Several prior studies demonstrated the effectiveness of paraeducator training to support students with severe communication disabilities (e.g., Light et al., 1992; McNaughton, & Light, 1989; Payne & Ogletree, 1995). While other investigations have reported positive changes in staff behavior following training (Light et al.; McNaughton & Light; Payne & Ogletree), this study shows that training using

self-evaluation resulted in immediate behavior change. After receiving training that included verbal instruction, modeling, role playing, and video examples, all three paraeducators demonstrated dramatic changes in prompting and responding behavior in the first probe after intervention.

Self-Evaluation

The present study used self-evaluation as a strategy to improve paraeducator performance. Self-evaluation has proven to be an effective strategy (Allinder, 2000; Belfiore & Browder, 1992; Browder, Liberty, Heller, & D'Huyvetters, 1986). Although the treatment package contained several components that could have contributed to changes in paraeducator behavior (e.g., instruction on communication, students with significant disabilities, problem behaviors, augmentative and alternative communication (AAC); demonstration of AAC devices; modeling prompting and responding behaviors ;), the use of self-evaluation strengthened the overall outcomes of the study. When paraeducators were instructed to monitor their behavior (number of times they prompted student use of AAC and responded to student requests) these behaviors increased dramatically.

This current study makes several contributions to the literature in the areas of self-evaluation and paraeducator training. First, the present study contributes to the literature by extending research in the area of staff self-evaluation. Although the treatment package contained several components that could have contributed to changes in paraeducator behavior, the use of self-evaluation strengthened the findings. When paraeducators were instructed to monitor their behavior (number of times they prompted student use of AAC and responded to student requests) these behaviors increased dramatically.

Second, this study contributes to the literature by showing that training paraeducators using a treatment package including self-evaluation resulted in increases in their prompting students to use AAC and responding to student requests. Paraeducator behavior resulted in increases in student use of AAC and decreases in problem behaviors.

Third, the study contributes to the litera-

ture base on the training of paraeducators by demonstrating that when paraeducators are provided explicit training on key instructional behaviors aligned with actual responsibilities, major gains in paraeducator performance and related gains in student performance are attainable.

Student Behavior Change

The outcomes suggest that two students increased the number of times they attempted to use AAC to communicate. The third student attempted to use AAC one time during intervention. Student problem behaviors decreased in all three cases. The effectiveness of teaching functionally equivalent communicative behaviors to replace problem behaviors has been documented throughout the literature (Bird et al., 1989; Carr & Durand, 1985; Durand, 1999; Durand & Carr, 1991, 1992; Gerra & Dorfman, 1995; Horner & Budd, 1985; Lalli, Browder, & Mace, 1993; Wacker et al., 1990). The present study is similar to prior research in that the use of AAC resulted in fewer occurrences of problem behavior.

In conclusion, this research demonstrated that training paraeducators using a treatment package including self-evaluation resulted in increased prompting of student use of augmentative communication devices and increased responding to student attempts to communicate. This is important because effective training programs for paraeducators who support students with severe disabilities who use AAC are limited. If immediate and dramatic change in behavior can be achieved through training paraeducators in a one to two hour training session as demonstrated in this investigation, additional training may result in significant improvements in practice. Functional communication training using assistive technology is an effective strategy for reducing serious problem behaviors with students who have significant disabilities. Future research is needed to assist in understanding and overcoming the barriers to effectively training paraeducators in supporting students with severe disabilities.

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