Promoting Independence in Integrated Classrooms by Teaching Aides to use Activity Schedules and Decreased Prompts

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Abstract: This study assessed a strategy to promote independent engagement in selected activities for children with disabilities in three integrated public school classrooms. A nonconcurrent multiple-baseline design, replicated across two aide-child pairs, was used to evaluate the effectiveness of a sequence of instructions about prompt reduction for integration aides and the use of photographic activity schedules on aides' prompting and children's engagement. During intervention, there was an increase in independent engagement for all children. Instructional sessions, reminders to reduce prompts, and an instruction to use physical prompts only, resulted in low levels of prompts by all integration aides. On a brief questionnaire, all aides expressed their satisfaction with the program. These findings have important implications for staff training in public school settings, and for promoting the independence of children in integrated classrooms.

One of the main themes of integrated or inclusive education is promotion of self-direction by all students, and reduction of children's dependence on supervising adults (Servatius, Fellows, & Kelly, 1992; Stainback, Stainback, & Jackson, 1992). This means promoting independent engagement in classroom activities for children with disabilities and programming the withdrawal of extra assistance from teachers, specialists, and classroom aides.

Cole, Meyer, Vandercook, and McQuarter (1986), in a study of peer social interaction, observed that assistance from teachers may have initial benefits in promoting social play, but these effects diminish if teacher assistance continues without gradual reductions over time. In related research on controlling the rates of teachers' prompts and praise, they demonstrated that, following the implementation of strategies to promote cooperative play, lower rates of intervention resulted in equal or higher levels of appropriate play among children with autism and their classmates (Meyer et al., 1987).

This study grew out of the investigators' observation that professionals are hesitant to step away from children's interactions. Paraprofessionals or classroom aides may be even more hesitant to reduce interactions with students with disabilities because their primary role is one of providing support and assistance. Regardless of educational setting, children with severe disabilities spend the most time with teacher assistants (Cole & Meyer, 1991), who most often work with them on an individual basis (May & Marozas, 1981). Therefore, assistants' or aides' reduction of prompts is critical if students with disabilities are to independently engage in classroom activities.

Although the use of classroom assistants is common, and their skills are crucial to the quality of public education programs (Guralnick, 1981; Reinoehl & Halle, 1994), there is a paucity of research focusing on assistants' behavior or skills. One recent study, using classroom assistants as primary participants, demonstrated that 4 assistants with no prior training in behavioral intervention could be

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taught to effectively implement peer-mediated social interaction strategies (Storey, Smith, & Strain, 1993). However, during an enhanced prompting and reinforcement condition, the assistants used means of 18 to 32 prompts within the 5-min sessions. Teaching the assistants to reduce prompts was not a part of this research.

The present study used resources found in the typical classroom environment (Fantuzzo & Atkins, 1992) and aimed to increase the independent engagement of children with disabilities by (a) decreasing prompts from aides, and (b) using pictorial activity schedules to diminish dependence on adult support.

Picture prompts have been used successfully to increase the play initiations of children with severe disabilities (Jolly, Test, & Spooner, 1993). Pictorial sequences or schedules have been used to promote acquisition and maintenance of complex vocational tasks (Wacker, Berg, Berrie, & Swatta, 1985) and to increase independent activity in vocational (Sowers, Rush, Connis, & Cummings, 1980), group home (MacDuff, Krantz, & McClannahan, 1993), and home (Krantz, MacDuff, & McClannahan, 1993) settings.

Method

Subjects and Setting

The study was conducted in an elementary school located in a middle-class suburb of Melbourne, Australia, during ten months of one academic year. The first author acted as a researcher and consultant in this setting throughout the previous three years. The school's Integration Coordinator identified three child-aide pairs as possible participants. These pairs met the following requirements: (a) the child had an identified disability and was assigned an integration aide for assistance with most classroom activities, and (b) the aide working with that child had no formal training or education in the area of disabilities. In Victoria, Australia, aides are not required to have certificates or degrees in teaching or related fields because their work is considered to be under the supervision of qualified classroom teachers.

Aides typically worked with one child with a disability in the morning, and a different child in the afternoon. Each of the aides worked with only one child involved in the study. Lorna (the aide) and Mike, an 8.5 year-old boy born without the left portion of his cerebellum were selected as Pair A. Mike had an intellectual disability, hyperactivity, ataxia, and frequent drooling. Lorna had no formal teacher training, had worked as an aide for six years and for the previous two years at the elementary school that was the setting for the study. She had attended a 64-hour evening course designed for integration aides. The course content included lectures on child development, working on a team, using music and drama with children, and information about local services. Approximately 10 hours were devoted to lectures on direct instruction, the use of reinforcement, and toilet training.

Pair B was comprised of Sarah, who had worked as an aide for a total of nine years (including seven years at the elementary school used in the study), and Sam, an 8-year-old boy with Fragile X syndrome. Sarah's only related education was the course for integration aides described above. Although Sam was included in all of the activities with his third-grade classmates, his academic skills were well behind those of his peers. He often failed to attend to activities, materials, and people, and frequently responded to questions and directions with echolalia.

Pair C consisted of Jill, the aide, and Larry, a 7 year-old boy with autism. Jill began working as an aide at the elementary school six years prior to the study. Although she had no teacher training, she had completed a two-year course in London that focused on working with disadvantaged pre-school children. Larry, in second grade, was in his first year at the school; prior to his full integration at the elementary school he had attended a program for children with autism. Typically, he did not attend to the teacher or follow her instructions, and the aide often interpreted or repeated directions to him. He was described as a very active child who had difficulty focusing on classroom activities, especially following outdoor play periods.

There was a second child with a disability (cerebral palsy) in Larry's classroom. Mike and Sam were the only children with identified disabilities in their classrooms.

Dependent Variables

Ten-minute observation sessions were scheduled to obtain data on children's independent engagement in activities and on the quantity and types of prompts from the aides. The observer(s) arrived in the classroom just prior to the beginning of the selected activities. Following 10 minutes of recording, they either left the room quietly, or met with the aide outside the classroom to schedule the next session.

Aides' Prompts. Each minute was divided into 15-sec intervals, and partial-interval time sampling was used to record prompts. Prompts were coded as verbal (e.g., "Put away the book", "Where does your name go?" or "You forgot to wash your hands"); gestural (e.g., pointing, nodding, shaking the head to indicate yes or no, or modeling a correct response); and physical (e.g., hand-over-hand assistance or a touch on the shoulder). The category "no prompts" was scored if none of the prompts described above was observed anytime during the interval.

Children's Engagement. Momentary time-sampling was used to record independent engagement. On the 59th second of each minute, a child was scored as independently engaged if no prompts were recorded for the previous 15-sec interval, *and* if he was (a) visually attending to another person or to materials, (b) looking at the photographic activity schedule, (c) appropriately manipulating materials, or (d) in transition from one setting to another as indicated by the photographic sequence. He was recorded as not independently engaged if (a) prompting occurred at the moment of observation or within the prior 15 seconds; (b) he was engaged in inappropriate behavior such as tantrumming or grabbing another child's materials; or (c) he was not visually attending to other persons or materials or engaging in a classroom activity.

Independent Variables

On schedule was recorded on the 30th second of each minute using momentary time-sampling. Children were scored as on schedule if they were engaged in an activity depicted in the photographic sequence (MacDuff et al., 1993). For example, on schedule was scored if a boy was using soap at the sink and his picture album contained a photo of handwashing. If he was appropriately reading a book when the photographic activity schedule depicted writing, then not on schedule was recorded. All recording stopped if the aide or the child left the setting.

Procedure

A meeting was held with each aide to identify an activity already established as part of the child's classroom routine that had independent participation as the aim. They chose activities in which the children had demonstrated their abilities to perform the target tasks but were not completing the sequences independently. The use of photographic schedules was discussed, and the benefits of using pictures as cues for completion of tasks was emphasized. The aides were told that the main rationales for baseline observations were the identification of photographic sequences, and evaluation of children's skills in working independently. Photographs of selected activities were taken when the classroom was empty (e.g., during recess).

Each aide identified a different activity as the focus of her program. Lorna (Pair A) identified a classwide, independent activity time as a good opportunity for incorporating Mike's activity. Although many of Mike's classmates selected silent reading at this time, Mike was unable to read and had been using this time for art activities with the aim of increasing color identification. Practice trials revealed that Mike did not have the fine motor skills to use scissors or glue without assistance. Therefore, Lorna selected independently threading colored beads which Mike used to create a necklace that he could either wear or give to a friend.

Sarah (Pair B) selected independent toileting skills. Although Sam had most toileting skills, he consistently requested Sarah's assistance with toileting. His classmates rarely requested assistance with toileting. Jill (Pair C) selected the transition from a class meeting to writing independently at a desk. Unlike his classmates, Larry would wait for detailed instructions in order to begin his seatwork activities.

Each of these selected activities were ap-

proved by the classroom teachers, who were informed of the aims of the study. Teachers did not receive reports on observational data until the completion of the study, when they and the aides were informed of all results.

Baseline

All baseline observations occurred at the identified time of day when the pre-selected activity was scheduled. The children followed their class routines and the aides were requested to behave as usual.

Intervention

Photographs were presented in small photo albums, with slip-in, plastic pages, in the sequence to be followed by the child. Children were required to keep these albums with them throughout the activity. Mike's album contained photographs of increasingly complex bead combinations to be threaded at his desk. Sam's album depicted the sequence of steps necessary to complete toileting skills independently, from leaving the classroom to returning. Larry was given a schedule that began with a photograph of the meeting mat in the classroom; subsequent photographs showed his desk, his pencil case, his writing pencil being removed from the case, etc.

The intervention with the aides was a sequence of interactions that focused on prompting. The sequence included: (a) an initial one-to-one meeting to establish a common vocabulary about prompting and to introduce the importance of prompt reduction; (b) verbal reminders to reduce prompts following observation sessions, (for Jill these included one review of graphs depicting her own and Larry's performance); and (c) brief one-to-one meetings requesting aides to stop using verbal and gestural prompts, and to use physical prompts only.

As part of the initial ninety-minute meeting aides were individually shown a twenty-five minute videotape entitled, *Teaching people with developmental disabilities: Prompting* (Singer & Irvin, 1988). Following the viewing of the tape, the meeting with each aide continued for approximately one hour. The aides were reminded of the focus of the program--to foster independent skills. The aides were asked to decrease all prompts, especially verbal prompts, and to provide opportunities for the children to independently complete tasks. All of the aides agreed that they used too many prompts, and stated that they would reduce prompting. The use of contingent praise was encouraged. They were instructed to review the photographic schedules with the children so that the boys would be familiar with the sequence of pictures, and then to use them as a guide for the children instead of using verbal and gestural prompts.

Prior to the activity the aides would ask the children to get their picture books and complete the activities. Any additional discussion of the books or the pictures was scored as a prompt. Following observation sessions, aides were reminded that the aim of the program was to reduce prompts and to use the photographic sequences as guides for independent task completion.

Toward the end of the academic year, brief meetings were held with each aide and they were instructed not to use verbal or gestural prompts and to use physical prompts only. The aides were told that research conducted by the authors had shown that children remain dependent on verbal and gestural prompts, and that the use of physical prompts might help the children work independently, and without prompt dependence. Physical prompts were modeled, and all aides agreed to try this strategy.

All participating integration aides completed a brief questionnaire at the end of the academic year. They were asked to identify the most and least valuable aspects of the project, and comment on whether they would recommend participation in a similar project to other integration aides and for other children with disabilities.

Experimental Design

A nonconcurrent multiple-baseline design (Kazdin, 1982), replicated across two aide-child pairs, was used to evaluate the effectiveness of instructions to aides and photographic schedules on the levels of prompting by integration aides and the levels of child engagement.

Interobserver Agreement

Two graduates with B.A. degrees in Disability Studies were paid as second observers. Video-taped recordings of teacher-child interactions were used for observer training. Training continued with each second observer and the first author until interobserver agreement scores of 85% or higher were achieved for a minimum of three consecutive sessions.

When two observers simultaneously recorded activities in the school, they used physical distance and folders to keep their scoring hidden from one another and from the aides. Observers carried stopwatches which were started simultaneously at the beginning of each observation session. Second observers remained unaware of the occurrence and content of meetings with aides so that their recording would not be influenced by knowledge of intervention strategies.

Interobserver-agreement observations were obtained during each phase of the study and for 36% of the sessions for Pair A, 31% of sessions for Pair B and 30% of sessions for Pair C. Agreements were scored on an interval-by-interval basis, and percentage interobserver agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Mean interobserver agreement was 86% for Pair A (range = 79% to 91%); 94% for Pair B (range = 86% to 99%); and 95% for Pair C (range = 91% to 100%).

Results

Figure 1 shows the percentage of intervals scored for each type of prompt used by aides during observations across phases. Aides frequently used multiple prompts during baseline. All aides used verbal prompts most often, followed by gestural, and then physical prompts. All aides used prompts during the majority of the 15-sec intervals observed during baseline.

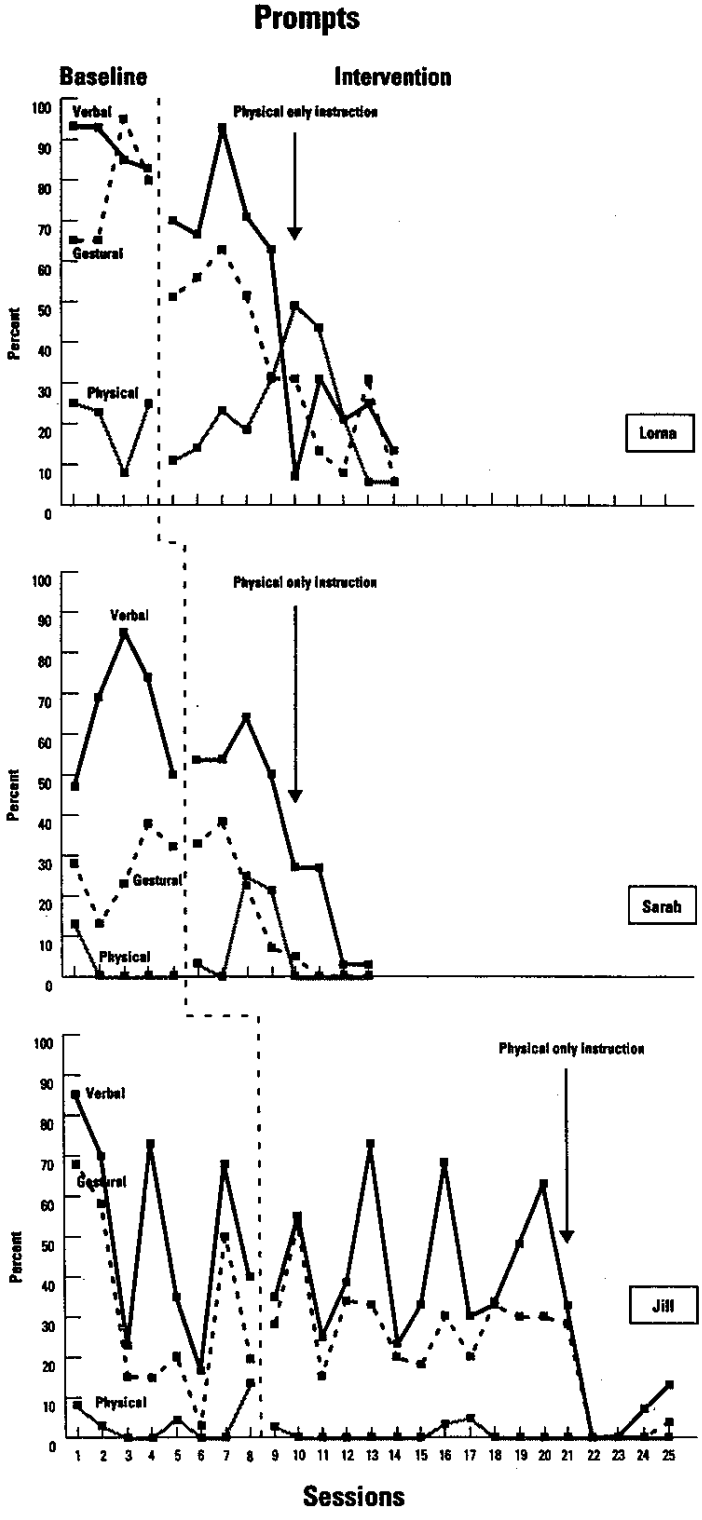
By the end of the intervention phase, there was a reduction in verbal and gestural prompts by all three aides (see Figure 1). The decreasing trends for types of prompt differed for each aide. Compared with baseline levels, Lorna's percentage of gestural prompts decreased immediately after intervention and a lower percentage of verbal prompts was scored in all but one observation during intervention. Sarah's percentages for all types of prompts decreased steadily after the third observation during intervention (see Figure 1). Compared with baseline levels, Jill's percentage of physical prompting diminished after the introduction of intervention. Verbal and gestural prompting levels decreased most markedly for Jill after the instruction to use physical prompts only. Following this instruction, Lorna was the only aide to initially increase her use of physical prompts versus verbal and gestural prompts.

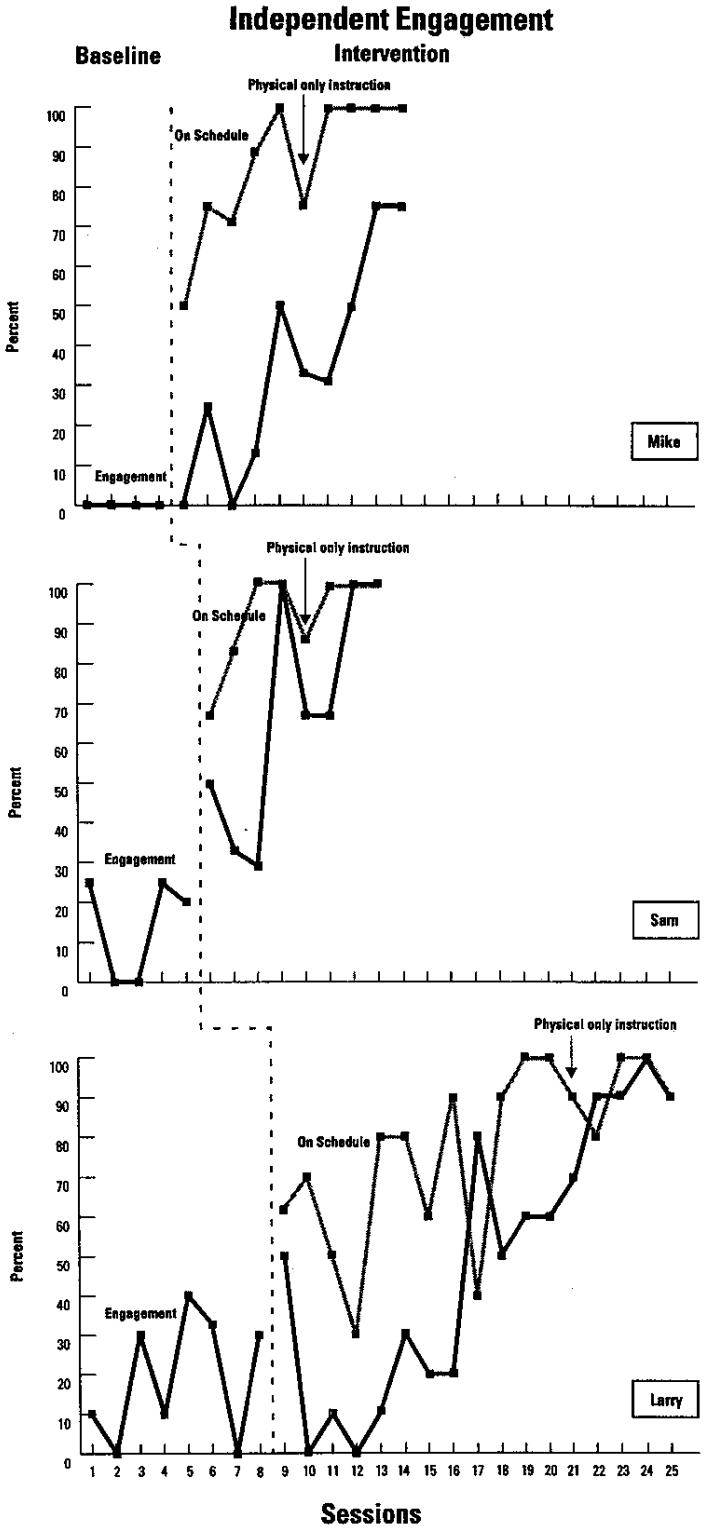
Despite of the high percentages of intervals scored with multiple types of prompts during baseline, children's engagement levels remained low. Figure 2 shows the percentage of intervals scored for independent engagement in selected activities.

The percentage of time samples scored as on-schedule following the introduction of photographic activity schedules also is depicted in Figure 2. Following the introduction of photographic activity schedules and instructional sessions for the aides, all children were scored as on-schedule during 100% of one or more observation sessions. However, verbal and gestural prompts by aides continued to occur during activities (see Figure 1), and therefore, the instruction to use physical prompts only was introduced. Immediately following this instruction, on schedule decreased slightly for all children, but quickly returned to 90% to 100% (see Figure 2).

During intervention, independent engagement improved for all children and reached 90% to 100% for two of the children by the end of the study (see Figure 2). Mike, whose percentage of engagement was consistently 0% during baseline, reached 75% by the end of the study. Independent engagement im-

Figure 1. The percentage of intervals scored for verbal (black line), gestural (dashed line), and physical (light-gray line) prompts during 10-min observation sessions for three integration aides.


Prompts
Baseline
Intervention
Physical only instruction
Verbal
Gestural
Physical
Percent
Lorna
Sarah
Jill
Sessions


Independent Engagement
Baseline
Intervention
Physical only instruction
On Schedule
Engagement
Mike
Sam
Larry
Percent
Sessions

proved immediately after intervention for Sam. Mike and Larry showed variable but increasing trends during intervention. Following the physical prompts only instruction, independent engagement percentages continued to increase for Larry and also increased for Mike and Sam following an initial, small decrease.

Discussion

Baseline observation revealed that integration aides frequently used multiple prompts during activities they had identified for independent child engagement. Their frequent use of verbal prompts was especially noteworthy. Instructional sessions about the use of prompts, videotaped examples of effective prompting procedures, discussion of the use of prompts in relation to the child with whom the aide was working, reminders after observation sessions to reduce prompts, and instruction to use physical prompts only (accompanied by modeling), resulted in low levels of prompts by aides, and high percentages of independent engagement by children with disabilities.

During intervention verbal prompting remained the most frequent type of prompt recorded for all aides. Percentages of verbal prompting were lower for all aides following the instruction to stop using verbal and gestural prompts and to use physical prompts only. However, the fact that two aides (Sarah and Jill) were not observed to use physical prompts following this instruction requires further exploration. If physical prompts are not commonly used in public school classrooms then aides may be hesitant to use them and as a result, choose to reduce all types of prompts, including any manual prompts.

One implication of these results is that classroom assistants and teachers in public school settings need further training about prompting procedures and prompt dependence. Specific prompting strategies can not only increase children's skills, but can also promote independent engagement of these skills. In addition, classroom teachers must understand, and communicate with aides, that decreases in talking with or at children with disabilities, and increases in children's independent engagement will be viewed as a result of effective work by the aides. An additional benefit of independent engagement by children with disabilities may be increased opportunities for integration aides to assist with the teaching of typical classmates.

An important contribution of this study is the demonstration that children with severe disabilities can participate in selected activities in integrated classrooms with minimal prompts from aides. By the end of the study, all of the children followed their activity schedules during 90% to 100% of time samples. Previous research has demonstrated that children with disabilities are able to follow photographic activity schedules and remain on schedule during 100% of observations for many consecutive sessions (MacDuff et al., 1993).

The photo albums were the only additions to the classroom environments. Changes in the behavior of the children and the aides were the result of a relatively minor alteration in the classroom routine that did not necessitate restructuring any activity. The study demonstrates the effectiveness of a minimal intervention that fits into typical classroom environments.

Staff Satisfaction

On the post-study questionnaire, all of the aides indicated that they would repeat the program with other children and would recommend it to other aides. In addition, all three aides reported that the program was valuable for the child, and that the "photo sequences" or "picture prompt cards" were the most helpful. Two aides identified least helpful aspects of the program for the child: Jill (Pair C) noted that Larry commented about his difference from other students in the class

Figure 2. The percentage of occurrence of independent engagement (black line) and on schedule (light-gray line) scored during 10-min observation sessions for three children in integrated classrooms.

because he had pictures to follow; and Sarah (Pair B) commented that constructive verbal contact could be lost if she used only physical prompts.

In spite of the small, unobtrusive size of the photo albums and the brief observation periods, Larry was aware that he was the focus of a program in which his classmates were not participating. Ideally, any teaching strategy should be selected on the basis of the benefit for the student. Although the increase in Larry's independent engagement and the decrease in Jill's prompting support the use of this program, additional strategies aimed at increasing children's skills could be implemented with small groups of children rather than a single child.

Sarah's comment about valuable verbal communication indicates the need for further education about the effects of antecedent and consequent events on behavior, or in this situation, the difference between prompts and praise. Although contingent praise (a form of verbal communication) was encouraged, Sarah's response to the questionnaire indicated that she interpreted the instruction not to use verbal prompts as an instruction not to talk to Sam.

Each aide responded differently to a question about which program aspects were most helpful. Jill wrote that it helped her identify difficult areas for Larry. Sarah commented that she learned another approach to help children be independent. Lorna stated that the program helped Mike to be less dependent on her and improved the quality of her teaching time. She was the only aide who commented on the relationship between her prompting and "making Mike reliant on me."

The aides, teachers, and the Integration Coordinator all expressed their satisfaction with the program. Following the study, the Integration Coordinator requested a general in-service for all integration aides on fading of prompts.

In summary, the present study contributes to the literature by (a) focussing on the development of children's independent skills in integrated classrooms, (b) expanding the research on teaching the reduced use of prompts, and (c) focusing on the skills of classroom aides who have little formal instruction in the use of behavioral procedures.

This research could be expanded in the future by (a) systematically fading the use of photographic schedules as cues for engagement in activities, (b) evaluating the effects of implementing a no-verbal or no-gestural prompts and physical prompts only condition following baseline, (c) evaluating the generalization of decreased prompts by aides across activities and children and (d) evaluating children's ability to work independently across classroom aides.

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