

# Rapid Training of a Community Job Skill to Nonvocal Adults with Autism: An Extension of Intensive Teaching

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## ABSTRACT

We evaluated an intensive program in a simulated format for rapidly teaching a job skill to nonvocal adults with autism. Following baseline probes with a new work task of assembling mailing boxes at a publishing company, 3 supported workers individually received repeated teaching sessions at a simulated work site. All workers met criterion with 1 day of simulation teaching, with subsequent criterion level performance upon returning to the job (1 worker required booster trials). Intensive teaching did not occasion problem behavior nor unhappiness indices. Improved work performance also occurred with two generalization tasks involving different materials. Implications for practitioners focus on improving worker performance without interfering with work completion that often accompanies on-the-job training. Potential applications of intensive programs for rapidly teaching other skills are discussed. Descriptors: adults with autism, intensive teaching, supported work

The benefits of involving adults with severe disabilities in community-based, supported work have become well established. Relative to spending time in nonwork programs, such as adult activity centers, supported work typically results in more functional activity (Reid, Green, & Parsons, 1998) and increased community involvement (Wehman, Brooke, & Revell, 2007). Supported work also is frequently associated with increased income when compared to sheltered employment (Wehman, Inge, Revell, & Brooke, 2007). However, despite these and related benefits of supported work, most people with severe disabilities do not work in community jobs. Rather, adults who have severe intellectual disabilities and/or autism at the severe end of the spectrum usually work in segregated, sheltered settings or do not work at all (Conley, 2007; White & Weiner, 2004).

One reason for the lack of supported work involvement among adults with severe disabilities is the significant amount of training they often require to perform work skills. Extensive on-the-job training is costly for employers (Cimera, 2006). The part-time nature of most supported jobs also limits time that can be dedicated to on-the-job training.

To reduce time requirements associated with on-the-job training, we have been evaluating a simulation approach with adults who have severe autism that involves teaching work skills in settings separate from the job site (Lattimore, Parsons, & Reid, 2006, 2008). Training can be provided during the week when workers are not at the job site because adults with severe disabilities who do obtain community jobs usually do so on a part-time basis (Garcia-Iriarte, Balcazar, & Taylor-Ritzler, 2007). Our results have indicated that adults with severe autism acquire work skills more quickly if on-the-job training is supplemented with simulation training (Lattimore et al., 2006). Providing simulation training to workers before they begin new job tasks also can enhance work performance when the duties subsequently are initiated at the job site (Lattimore et al., 2008).

Although research on simulation training has been encouraging, continued research with this technology seems warranted to give practitioners a wider set of options in terms of how to provide simulation training. Increased options for training job skills could allow agencies to select an option that fits within their operating characteristics, thereby potentially assisting more adults

with severe autism in acquiring skills necessary to succeed in community jobs. More specifically, to date, simulation training has been provided in relatively brief (maximum of 30-min) sessions distributed across a number of days, encompassing from 1 to 4 weeks per individual and job skill trained. It can be effortful and time consuming in some agencies serving adults with severe disabilities to repeatedly prepare a simulated job environment, acquire necessary job materials, and re-arrange staff assignments to provide multiple training sessions on work skills. If the training sessions could be conducted all within 1 day, the setting preparation and staff assignment re-arrangement would only need to occur one time for each worker and skill trained. Currently, however, it is not apparent whether the reported effects of simulation training that has been distributed across weeks would similarly result if all training was conducted in 1 day.

Beyond providing another evidence-based option for practitioners interested in conducting simulation training, demonstrating how to successfully teach a job skill in 1 day could have a corresponding job-related benefit for supported workers. That is, when a new

work duty is assigned on a job, there is not always sufficient time to allow multiple teaching sessions across days or weeks before the duty is expected to be performed at the job site. If training in 1 day was a viable option for rapidly teaching a job skill, then supported workers could acquire the skill more quickly and begin performing the new work duty competently on the job.

The potential benefit of rapid or intensive teaching with people who have severe disabilities was recognized relatively early in the behavioral field (see Parsons, Reid, Towery, England, & Darden, 2008, for discussion). In particular, Azrin and colleagues developed intensive teaching procedures that were successful in teaching individuals with severe disabilities to dress (Azrin, Schaeffer, & Wesolowski, 1976), eat (Azrin & Armstrong, 1973), and toilet independently (Azrin & Foxx, 1971) in short periods of time (e.g., 2 to 5 consecutive days). Since the early research with self-help skills, little attention has been directed to intensive teaching programs. In particular, such approaches have not been evaluated with work skills or with simulated teaching formats.

The primary purpose of this study was to extend the research on simulation training of community job skills by evaluating the effects of conducting all training sessions in 1 day rather than distributing the sessions across weeks as has occurred previously. The intent was to demonstrate a means of rapidly teaching a community job skill to adults with severe autism for the practical reasons summarized previously. A secondary purpose was to extend the early research on intensive teaching of self-help skills by evaluating the approach with a community job skill. The specific simulation teaching program evaluated was based on the early intensive teaching protocols with one exception pertaining to staffing requirements. Specifically, the initial programs often involved two trainers working with one trainee (Azrin & Armstrong, 1973; Azrin et al., 1976), which can be difficult to arrange

in applied settings. This feature may represent one reason why more recent attention has not been given to intensive teaching in routine practice (Parsons et al., 2008). The intensive teaching program evaluated here involved only one trainer working with each trainee.

## Method

### *Settings and Participants*

The primary setting was a small publishing company in which 4 supported workers (participants) worked on a part-time basis. Work duties varied over time based on the needs of the company. Most common duties included clerical work related to advertising (e.g., putting mailing labels on fliers) and office cleaning tasks. The secondary setting (in which intensive teaching occurred) was a classroom in an adult education program on the campus of a residential facility for persons with severe disabilities. The supported workers attended the adult education program on weekdays when not at work at the publishing company. All procedures conducted as part of this investigation were within the approved work scope of the supported work contract and the mission of the adult education program.

Each supported worker was diagnosed with autism and profound intellectual disabilities on at least two independent evaluations. Each worker was nonvocal and typically communicated by pointing or leading staff to desired objects, although Mr. Geoff also occasionally used a small number of manual signs. Mr. Mann (age, 31 years), Mr. James (age, 31 years), and Mr. Ream (age, 44 years) responded to simple vocal directions accompanied by manual signs and gestures. Mr. Geoff (age, 42 years), who had a severe hearing loss, responded to simple gestures and a small number of manual signs. All workers displayed stereotypic behavior (e.g., finger gazing, body rocking), all had histories of aggressive behavior and/or property destruction, and 3 had histories of self-injury. However, except for stereotypic, challenging behavior occurred

infrequently while the participants were at work. These individuals were selected for the investigation because they were adults with disabilities characteristic of the severe end of the autism spectrum (Powers, 2000) and because they all worked part time in the same company. The job coach (experimenter) who routinely worked with the supported workers carried out the intervention procedures. The job coach had 12 years of supported work experience.

### *Behavior Definitions, Observation Systems, and Interobserver Agreement*

Each supported worker received training on a new job task that the company manager wanted to assign to the workers. The task involved assembling boxes for mailing books that had been purchased from the company. None of the supported workers had previously performed this task. The box-assembly task was analyzed into 14 steps (pick up cardboard from pile, fold small flap on right side of box along designated crease in cardboard, fold flap on right side, fold both flaps inward to form corners of the box, etc.). The primary dependent variable was the percentage of task steps performed independently. To be scored as performed independently, a task step had to be completed by the worker correctly (as written in the task analysis) and without a preceding vocal, gestural, or physical prompt that directed the worker to complete the designated step.

Each worker was observed individually during probes as he worked on the newly assigned task at the employing company. Each task-analyzed step was recorded as being completed independently or with job coach assistance. Probe observations were conducted by the experimenters (excluding the job coach) positioned in the workroom of the supported workers or in the doorway to the workroom. A probe was initiated by the job coach placing a pile of unassembled boxes (flat pieces of cardboard with creases in set places for folding and slits for inserting respective parts of the cardboard) in the worker's view on the work table and

providing a general vocal or signed cue (e.g., “make the box”). The general cue to begin work was not considered a prompt to perform a specific step for recording purposes. If after 10 s the worker did not correctly initiate the first step of the task analysis, the job coach completed the step out of view of the worker so that the box would be ready for the worker to initiate the second step of the task analysis (cf. Lattimore et al., 2006). The latter process involved the job coach taking the cardboard, turning his back to the worker so that the worker could not see the job coach’s actions, completing the step with the cardboard, and then replacing the cardboard in front of the worker. If the worker made a response other than correctly completing the first step of the task analysis, the job coach interrupted the response and completed the step out of the worker’s view. Each time the job coach completed a step for the worker, the job coach then repeated the general cue to work. If a worker completed a step independently, the job coach did not interact with the worker and let the worker proceed through the task-analyzed routine. The process continued until the box was assembled. In this manner, during each probe, a worker had an opportunity to complete each step in the task analysis one time. One observation occurred per work day for a supported worker.

Interobserver agreement was assessed on 22% of all observations on the job, including for each worker and experimental condition. Interobserver agreement was determined on a step-by-step basis and calculated using the formula of number of agreements divided by number of agreements plus disagreements, multiplied by 100%. An agreement was scored only if both observers recorded the occurrence of an independently completed step, or both observers recorded the nonoccurrence of an independently completed step, respectively. Mean overall agreement for independently completed task steps was 97% (range, 86% to 100%), mean occurrence agreement was 94% (range, 80% to 100%), and mean nonoccurrence

agreement was 87% (range, 0% to 100%). The 0% agreement occurred for one observation during post-intensive teaching observations and involved a low frequency of nonoccurrence (two disagreements between observers).

Two sets of secondary behaviors were defined and observed. The first set was problem behavior, defined as any behavior likely to cause harm to person or property (e.g., eye poking, turning over furniture, wrist biting, throwing materials or equipment). Data on problem behavior were collected to evaluate if the intensive teaching procedures were accompanied by such behavior. If the intensive teaching intervention appeared to occasion problem behavior, its acceptability in applied settings may be compromised. The concern over the possible association between intensive teaching and problem behavior existed for two reasons. First, problem behavior was reported to occur in some of the initial investigations of intensive teaching (Azrin & Armstrong, 1973; Azrin et al., 1976). Second, and perhaps related to the first concern, instructional demands occasion problem behavior for a number of individuals with severe disabilities (see Miltenberger, 2006, for a review). Frequently presented instructions are inherent in intensive teaching procedures. Problem behavior was observed continuously throughout each on-the-job observation for each participant and probed during at least 38% of intensive teaching trials in the simulated setting for each supported worker who received intensive teaching. For interobserver agreement purposes, occurrence of problem behavior was recorded according to the particular task-analyzed step that was being taught at the time. Interobserver agreement checks occurred simultaneously with agreement checks for independent performance during the on-the-job observations and during 58% of the probes during intensive teaching in the simulated setting, including for each participant. Throughout all interobserver agreement checks for problem behavior, no observer recorded any

occurrence of such behavior (100% agreement on nonoccurrence).

The other set of secondary target behaviors, observed only during intensive teaching sessions in the simulated setting, was indices of happiness and unhappiness. Data on indices of happiness and unhappiness were collected to evaluate if the intensive teaching sessions occasioned unhappiness among respective workers. Concern existed that the workers might dislike the intensive teaching sessions due to the effort required, and unhappiness indices are often associated with strongly nonpreferred situations (see Reid & Green, 2006, for a review). If intensive teaching appeared to occasion unhappiness among the supported workers, its appeal for application may be diminished. For Mr. James, indices of happiness and unhappiness were defined as in previous research using such indices. Specifically, happiness was defined as any vocalization or facial expression (smiling, laughing, or yelling while smiling) typically exhibited by people without disabilities when they are happy (Davis, Young, Cherry, Dahman, & Rehfeldt, 2004; Green & Reid, 1996; Ivancic, Barrett, Simonow, & Kimberly, 1997). Unhappiness was defined as any vocalization or facial expression (frowning, grimacing, crying, or yelling without smiling) typical of what people without disabilities do when unhappy (Green & Reid, 1996; Green, Reid, Rollyson, & Passante, 2005). Because previous evaluations with Mr. Geoff and Mr. Mann indicated that they displayed happiness and unhappiness in atypical ways, individualized definitions of happiness and unhappiness were used that had been previously developed and validated for these 2 participants (Lattimore, Reid, & Parsons, 2009). Specifically, for Mr. Geoff, indices of happiness were defined as patting a person on the back, laughing, or smiling, and indices of unhappiness were defined as hitting his head, pressing his finger on his eye, signing “finish” during an activity, turning over furniture, or physically forcing staff to do something.



For Mr. Mann, indices of happiness were defined as “wee/mee” vocalizations or smiling, and indices of unhappiness were defined as yelling, biting his hand, hitting his head, or head butting others. Happiness and unhappiness indices were not observed for Mr. Ream because his performance served as a control (he did not receive intensive teaching; see *Experimental Procedure*).

Indices of happiness and unhappiness were observed on a probe basis during 18% of intensive teaching trials in the simulated setting, including for each worker who received intensive teaching (however, only one trial included observations of happiness and unhappiness for Mr. Mann). Data were collected throughout intensive teaching trials using continuous 15-s partial-interval recording. Interobserver agreement checks were conducted during 57% of probe observations involving each supported worker, and interobserver agreement was calculated on an interval-by-interval basis. Overall, occurrence, and nonoccurrence agreement for happiness indices was 100%. No observer recorded any indices of unhappiness during any interobserver agreement check (100% agreement on nonoccurrence).

### *Experimental Procedure*

**Baseline.** The participants followed their usual work schedules, working approximately 1.5 hours per work day. Mr. Mann and Mr. Geoff worked two mornings per week whereas Mr. James and Mr. Ream worked one morning per week at the publishing company. During the regular work time, probes were conducted on the new task as described previously. When not participating in a probe session, the workers worked on other tasks with another job coach that usually involved collating manual pages.

**Intensive teaching.** Intensive teaching sessions occurred at the adult education program for each worker on a weekday when a worker was not at the job site. To enhance generalization from the intensive teaching site to the job site, the intensive teaching sessions were

designed to build in common stimuli with the job site. Specifically, the same job coach who conducted job-site probe sessions conducted intensive teaching sessions, and task materials used at the job site were taken to the adult education building to use in the intensive teaching sessions.

On the scheduled day for intensive teaching, the teaching process was initiated by the job coach placing the work materials on a table in the worker’s view and providing a cue to begin work. The job coach then used a most-to-least prompting strategy as described by Lattimore et al. (2006). Initially, the job coach physically guided the worker through completion of the step. Physical guidance involved the job coach placing his hands on the worker’s hand(s) and moving the worker’s hand(s) through the movements necessary to complete the step. As the worker began to correctly initiate a step without physical assistance by the coach, full physical guidance was reduced to partial physical guidance and then to shadowing. Partial physical guidance involved the job coach placing his hands on the worker’s arm(s) such that some but not all of the worker’s movements necessary to complete the step were guided by the job coach. Shadowing involved the job coach keeping his hands within approximately 9 cm of the worker’s arm(s) throughout the worker’s movements. The partial physical guidance and shadowing were conducted in a manner that allowed the job coach to immediately interrupt a worker’s incorrect action and prevent any step from being completed incorrectly. Interruption occurred as soon as a worker made an incorrect movement associated with a task step, such as starting to fold a box at a place that did not have a crease for folding. The physical guidance and shadowing were faded to vocal and/or gestural prompts as the worker became more proficient (e.g., after a worker completed a step with shadowing and no physical prompting, the job coach discontinued the shadowing on the next trial and provided only vocal or gestural prompts if the worker began to make

an error). However, if incorrect actions continued after a vocal or gestural prompt, the job coach quickly interrupted the worker’s movements and provided a physical prompt. A total task procedure was used in which teaching occurred on each subsequent step in the task analysis during each teaching trial (assembling one box constituted one teaching trial) in the manner just described. Praise was provided either vocally or by signing for approximately every fourth step completed correctly. This schedule for presenting praise statements during teaching was approximately the same schedule used by job coaches during the regular job routine.

Intensive teaching occurred within 1 day for each supported worker. The format of the intensive teaching involved a series of teaching sessions with repeated trials, with each session separated by short breaks (average of 12 min per break, range of 7 min to 20 min). Each session consisted of five or six trials, conducted as just described with the following exception. Beginning with the first trial on the second session, and for the first trial of each subsequent session, the teaching process was altered to assess progress of the supported worker trainee. Specifically, on these trials, a least-to-most prompting strategy was used and the worker’s independent performance or lack thereof was assessed for each step. The inclusion of one least-to-most prompting trial allowed for a more complete assessment of the worker’s progress because it allowed the worker an opportunity to complete each step independently unlike most-to-least prompting (Libby, Weiss, Bancroft, & Ahearn, 2008). Results of these trials also provided information regarding what steps on the subsequent training trial should be conducted without any physical prompts (i.e., those steps that the worker completed without physical prompts during the least-to-most prompting). During each break period between sessions, the supported worker was provided with a snack and/or drink that he had been previously observed to readily consume. Additionally, based on

a previous preference assessment, Mr. Geoff was also provided with a preferred activity (drawing on a sketch pad for a few minutes). The preferred activity and a snack and/or drink was provided to possibly reinforce completion of each teaching session and to possibly reduce the likelihood of unhappiness or problem behavior that may be associated with intensive teaching as described earlier (Green et al., 2005). Intensive teaching continued until a respective worker completed at least 80% of the steps of the task analysis independently during two consecutive teaching trials. The 80% independence criterion had been previously established at the company as an acceptable performance level for workers who attended work with the support of an assigned job coach. The specific number of teaching sessions and trials for each worker to meet criterion, as well as the amount of time that teaching encompassed, is summarized in Table 1 (each supported worker met the mastery criterion during the 1 day of intensive teaching).

*Post-intensive teaching.* When a worker met the criterion with intensive teaching at the adult education site, post-intensive teaching probes were initiated at the publishing company in the same manner as baseline probes. These probes began on the next day that the worker returned to work (within 1 or 2 days of the intensive teaching). When a worker completed at least 80% of the job's steps independently during a probe at the company, the worker began performing the task as part of the regular job routine. The job routine involved a job coach providing an instruction to perform the task, intermittently praising correct performance, and interrupting the supported worker's actions only if incorrect performance occurred. The interruption involved a correction procedure similar to teaching in terms of the job coach providing a more helpful prompt following the error. A company supervisor made periodic checks of the quality of the completed work as part of the usual work routine to ensure that

*Table 1: Summary of Intensive Teaching Process*

Worker	Number of training sessions	Number of training trials	Amount of time
Mr. Mann	7	32	2 hr 52 min
Mr. Geoff	3	13	42 min
Mr. James	7	32	2 hr 10 min

the book-mailing boxes were usable. Throughout the investigation, the company deemed all boxes completed by each supported worker usable.

One exception with the post-intensive teaching condition occurred with Mr. Mann (see *Results*). Following the second on-the-job probe during the post-intensive teaching condition, Mr. Mann was provided with a booster teaching trial at the job site prior to the next day's probe. The teaching trial involved a least-to-most prompting process. In total, Mr. Mann was provided with three booster teaching trials prior to three respective post-intensive teaching probes. Each booster teaching trial required a maximum of 2 min to complete. As a control procedure for the booster teaching trials provided to Mr. Mann, Mr. Ream was provided with three booster teaching trials (conducted in the same manner) while he was in the baseline condition.

*Follow-up.* Following observations during the regular job routine, intermittent follow-up observations were conducted across time periods of 4 to 30 weeks (follow-up observations were conducted for at least 20 weeks for each supported worker). During the follow-up period, each supported worker was periodically assigned to complete book-mailing boxes in addition to other ongoing duties. Each worker generally worked on the box-assembly task 1 or 2 days per month throughout the follow-up period.

### *Generalization Measures*

To assess the degree to which improvements in making the target boxes generalized to making other types of book-mailing boxes, observations were conducted during baseline and post-intensive teaching with two other boxes. In contrast to the target box that measured 28.2 cm x 22.5 cm x 5.7 cm when assembled, one generalization box measured 38.4 cm x 28.3 cm x 5.1 cm and the other measured 30.8 cm x 23.5 cm x 10.2 cm. Both sets of materials for making the generalization boxes were manufactured by the same company that manufactured the target boxes, and they required the same basic steps for assembly as the target box (i.e., the task-analyzed steps generally were the same but the materials differed in size). No teaching was conducted with either of the two generalization boxes.

### *Experimental Design*

The experimental design was a multiple probe across supported workers. One worker, Mr. Ream, remained in the baseline condition (with the exception of the booster sessions noted earlier) with his performance serving as a control over time. (Following training of the initial 3 workers, it was determined that additional workers would not be needed to assemble boxes. Mr. Ream continued working on other job tasks at the company and was paid during his participation in baseline as part of

the investigation in accordance with his ongoing work contract.)

## Results

As indicated in Figure 1, percentage of task steps completed independently during baseline probes at the job site was well below criterion for each supported worker. During baseline, Mr. Mann averaged 33% steps completed independently (range, 29% to 38%), Mr. Geoff averaged 46% (range, 7% to 64%), Mr. James averaged 38% (range, 21% to 57%), and Mr. Ream averaged 42% (range, 21% to 57%). Mr. Geoff's performance improved during the first three baseline probes but then stabilized well below the 80% criterion during the last five probes. Following intensive teaching, increases in independent step completion occurred for each of the 3 workers who received the teaching. The most notable increases occurred for Mr. Geoff and Mr. James, who surpassed the pre-established, on-the-job criterion on the first post-intensive teaching probe. Throughout the latter condition and observations conducted during the regular job routine, Mr. Geoff averaged 98% independent step completion (range, 93% to 100%) and Mr. James averaged 88% (range, 86% to 93%). Mr. Mann's performance showed a slight increase during the first two post-intensive teaching probes relative to baseline, but his performance on those probes ( $M$ , 40%) was well below the criterion level. However, Mr. Mann showed immediate increases following each of the three booster teaching trials on the job, and then met the criterion at 93% with the probe following the third booster trial. Mr. Mann's subsequent performance during the regular job routine maintained above the criterion level. In contrast to Mr. Mann's performance following intensive teaching and the booster trials, Mr. Ream's performance during baseline never surpassed 57% even after he was provided three booster teaching trials.

Follow-up observations while the workers completed the box-assembly

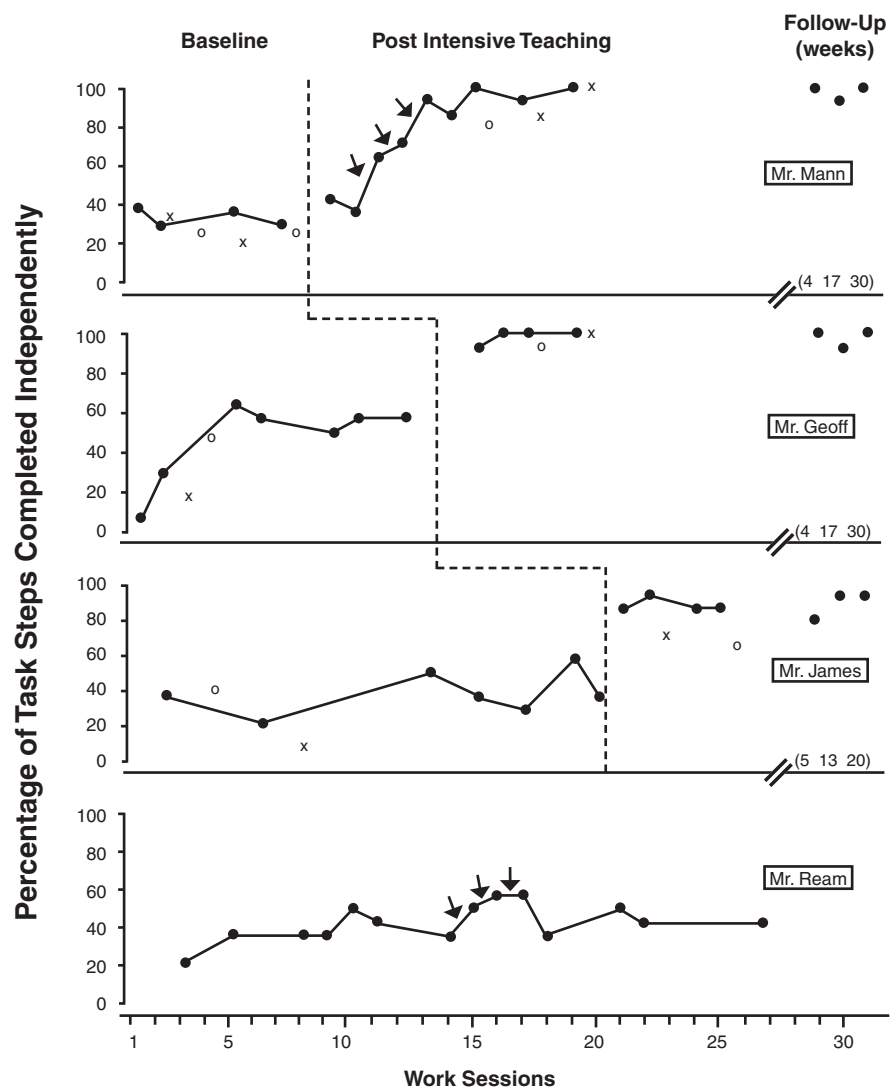


Figure 1. Percentage of work steps completed independently by each worker at the work site during each observation across experimental conditions. Each “o” and “x” indicates the percentage of independent steps with the two respective generalization box-mailing boxes. The arrows indicate where on-the-job booster teaching trials occurred.

task during the routine job indicated the improved performance observed during post-intensive teaching generally maintained for each of the 3 workers. Independent performance maintained above the criterion level throughout the 30-week follow-up period for Mr. Mann and Mr. Geoff, and for Mr. James throughout his 20-week period with one exception (79% independent performance at the 5-week follow-up observation).

### Generalization

No worker demonstrated criterion-level performance with either

generalization box during baseline, with a range of 15% to 50% independent step completion across the two generalization boxes and workers (Figure 1). In contrast, following intensive teaching with the target box (and the three booster trials for Mr. Mann), independent step completion for Mr. Mann and Mr. Geoff was above the criterion level for each of the two generalization boxes (range of 83% to 100% independent step completion). Mr. James' independent step completion also increased with both generalization boxes relative to baseline following intensive teaching on the target box, but not to the criterion level (71%

for one generalization box and 64% for the second generalization box).

### *Problem Behavior, Happiness, and Unhappiness Indices*

No problem behavior was observed during intensive teaching in the simulated setting for any participant. Problem behavior was also never observed for any participant during the on-the-job observation probes with the exception of one occasion during one probe with one generalization box for Mr. Mann. Indices of unhappiness, which were probed during intensive teaching at the simulation site, were also never observed to occur. Indices of happiness, likewise probed during intensive teaching, were observed to occur for 2 participants. Happiness indices averaged 100% of observation intervals for Mr. Mann (probed during only one trial of intensive teaching sessions) and 17% for Mr. James (probed during 34% of trials).

### **Conclusions and Guidelines for Practitioners**

Results appear to support the utility of the intensive teaching approach for rapidly teaching a community job skill to adults with disabilities at the severe end of the autism spectrum. All 3 supported worker participants met the mastery criterion in less than 1 day of intensive teaching in the simulation setting. Subsequently, during the on-the-job probes, 2 workers met the mastery criterion immediately upon returning to work. One worker (Mr. Mann) met mastery on the job following the intensive teaching and three brief booster trials at the work site. In contrast to the latter worker, the worker who received three booster trials on the job but not intensive teaching in the simulation setting did not show significant improvement at the work site. These results suggest that the performance gains of Mr. Mann were due to the intensive teaching and booster sessions combined and not just to the booster sessions although this cannot be concluded definitively. Each of the 3 workers who received intensive teaching then performed the job skills

above the mastery criterion during the regular work routine, and performance improvements generally maintained throughout follow-up periods of 4 to 30 weeks. Generalized improvements also occurred for each of the 3 workers who received intensive teaching across two other book-mailing boxes, with the improvements for 2 of the workers bringing their performance with the two generalization boxes to above criterion level.

As noted earlier, concern existed that the intensive teaching program may occasion problem behavior or unhappiness due to the high rate of demands and effort inherent in multiple teaching sessions in 1 day, and because there were reports of problem behavior in the earlier investigations of intensive teaching (Azrin & Armstrong, 1973; Azrin et al., 1976). Results indicated that problem behavior and indices of unhappiness were not observed for any participant during the intensive teaching sessions. In interpreting these results, it should be noted that for 2 participants, there was considerable overlap in the behavioral definitions for problem behavior and unhappiness indices. Additionally, none of the participants had reported histories of engaging in problem behavior to escape instruction (though this was not assessed formally). Problem behavior and/or indices of unhappiness may be more of an issue if intensive teaching is conducted with individuals who engage in problem behavior to escape or avoid instructions. Nonetheless, results for these 3 participants may at least reduce some practical concerns over intensive teaching being highly nonpreferred by adults with severe autism. The use of intensive teaching formats thus may be more acceptable to practitioners. It seems likely that the use of frequent breaks with preferred activities or edibles helped to reduce the potential unpleasantness of the intensive teaching sessions (cf. Green et al., 2005) although no formal evaluation of this aspect was conducted.

A primary guideline stemming

from this investigation is that intensive teaching of a new job skill away from the work site can be considered when a new job skill is assigned to a supported worker with severe autism. In this manner, the logistical and related demands of teaching the skill in simulation across a number of days or weeks could be alleviated. Furthermore, extensive on-the-job training could be minimized or eliminated. The latter outcome could resolve the common problem of expected job duties not being completed (or being performed by job coaches for a supported worker) when time has to be directed to teaching a new job skill while a worker is on the job (Lattimore et al., 2006). It should also be recognized, however, that providing multiple teaching sessions in 1 day can be rather laborious for the teacher and learner (Parsons et al., 2008). Thus, practitioners should determine the relative advantages and disadvantages within their settings of combining teaching sessions within 1 day versus distributing the sessions across days or weeks. Another issue that warrants attention when considering intensive teaching is the teaching skills of the instructor. The job coach who conducted all teaching sessions in this investigation was experienced in teaching adults with severe autism. Future research is needed in other situations with different job coaches to evaluate the generalizability of the results acquired here and perhaps identify areas of training for less experienced personnel who are employed as job coaches. Research is likewise needed to assess the effects of intensive teaching with other supported workers and with other job tasks. In this regard, the participants in this investigation had considerable prior experience at the publishing company and with somewhat similar work tasks. It is unclear if the same results would occur with adults who do not have similar supported work experiences.

Another implication of the results is that intensive teaching in general may warrant more attention by practitioners. As noted previously, intensive teaching appeared successful in early research for



rapidly teaching self-help skills (Azrin & Armstrong, 1973; Azrin & Foxx, 1971; Azrin et al., 1976) but has received little attention since these early reports. Results here appear to extend the research on intensive teaching by demonstrating that the same general approach used to teach self-help skills to people with severe and profound intellectual disabilities can be applied to rapidly teach a community job skill to adults with severe autism. Such results suggest that intensive teaching protocols may warrant more attention as a potential means of rapidly teaching other types of skills to adults with severe autism. Some skills in particular may warrant intensive teaching because they serve an especially critical role in an individual's day-to-day functioning by producing collateral changes in other important skills (e.g., pivotal behaviors; Koegel, Openden, Fredeen, & Koegel, 2006). Skills that serve a replacement function for problem behavior may likewise benefit from rapid teaching.

A related area of potential research and application with intensive teaching protocols is to enhance progress among individuals who are not progressing significantly on existing teaching programs. More specifically, a noted problem in a number of service settings is the extended length of time encompassed in teaching functional skills to some adults with severe disabilities (Sulzer-Azaroff, Pollack, Hamad, & Howley, 1998; Williams, DiVittorio, & Hausherr, 2002). Various applications of intensive teaching protocols may represent a useful means of accelerating the teaching process (cf. Parsons et al., 2008). In short, re-emphasizing application of a behavioral technology developed early in the history of behavior analysis (i.e., intensive teaching) may help resolve some challenges currently faced in routine practice.

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