TRAINING MAINTENANCE WORKERS WITH DEVELOPMENTAL DISABILITIES TO SELF-MANAGE UNSCHEDULED TASK DEMANDS WITH A PICTORIAL POCKET-PROMPT SYSTEM

by

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Abstract

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by

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A multiple-baseline design was used to measure the effects of most-to-least physical prompting on training maintenance workers with developmental disabilities to use a self-management pocket-prompt system to complete unscheduled tasks and return to scheduled tasks within allotted times. Three full-time maintenance workers at an agency for persons with developmental disabilities participated in the following phases: Baseline; Pretesting/training; Pocket-Prompt Training & Fading; Maintenance; and, Follow-up. Each prompt system contained two textual/pictorial representations of scheduled tasks and four representations of unscheduled tasks. Two unscheduled task cards were used in training, and two were used as generalization probes. Each worker demonstrated an ability to use the pocket-prompt system to monitor unscheduled task demands after physical prompts were withdrawn. Each worker's percentage of steps completed in one- and two-unscheduled task-sequences increased dramatically during treatment. All workers maintained the response through maintenance and follow-up sessions. Generalization was demonstrated by each of the workers in this study.

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TRAINING MAINTENANCE WORKERS WITH DEVELOPMENTAL DISABILITIES TO SELF-MANAGE UNSCHEDULED TASK DEMANDS WITH A PICTORIAL, POCKET-PROMPT SYSTEM.

Independent management of daily activities by persons with developmental disabilities is the goal of many treatment programs conducted by applied behavior analysts. Several self-management strategies have been used to promote independence in a variety of populations, including children and adults with: autism (Koegel, Koegel, Hurley, & Frea, 1992; Strahmer & Schreibman, 1992); emotional disturbances (Ninness, Fuerst, Rutherford, & Glenn, 1991); learning disabilities (Dunlap & Dunlap, 1989); and, mental retardation (Agran, Fodor-Davis, & Moore, 1986; Christian & Poling, 1997).

Self-management procedures have been used alone, or in combination with other procedures, and include the following: (a) antecedent cue-regulation (Agran, Fodor-Davis, Moore, & Deer, 1989; Kurtz & Neisworth, 1976); (b) performance feedback (Cuvo, Davis, O'Reilly, Mooney, & Crowley, 1992; Dunlap & Dunlap, 1989); (c) self-instruction (Agran et al. 1986; Christian & Poling, 1997; O'Leary & Dubey, 1979; Salend, Ellis, & Reynolds, 1989); (d) self-monitoring (Christian &

Poling, 1997; Koegel et al. 1992; Ninness et al. 1991; Strahmer & Schreibman, 1992); (e) self-recording (Ninness et al. 1991); and, (f) self-reinforcement (Christian & Poling, 1997; Koegel et al. 1992; Ninness et al. 1991; O'Leary & Dubey, 1979; Strahmer & Schreibman, 1992).

In a comprehensive review of the self-management literature, O'Leary and Dubey (1979) examined several studies that used self-management procedures to modify behavior. O'Leary and Dubey caution that prior verification of each learners' ability to perform the tasks that will be required is of critical importance when using any self-management procedure. According to O'Leary and Dubey, successful self-management programs promote a shift in the locus of control over behavior from externally initiated to self-initiated control.

Antecedent cue-regulation, a self-management procedure (Agran et al. 1989; Kurtz & Neisworth, 1976; Rusch, Martin, & White, 1985), as used to promote skill acquisition and response generalization, emphasizes the transfer of control over target behavior from one discriminative stimulus to another. When such discriminative stimulus-control procedures are used effectively, stimulus control is transferred from an established antecedent stimulus that is known to have influenced the target behavior in the past, (e.g., verbal instructions), to a newly selected antecedent cue (e.g., a picture prompt), that has not yet been established as a controlling stimulus. As a self-management procedure, antecedent cue regulation has been selected for further scrutiny in the present study.

As a discriminative stimulus-control procedure, antecedent cue regulation, in the form of picture-prompt training, has been the procedure of choice for teaching many people with developmental disabilities. Extensive research literature reports the successful application of picture-prompt training procedures to teaching a wide variety of skills. These skills include: Daily living skills (Pierce & Schreibman, 1994); grooming (Thinesen & Bryan, 1981); leisure activities (MacDuff, Krantz, & McClannahan, 1993); meal preparation (Johnson & Cuvo, 1981; Martin, Rusch, James, Decker, & Trtol, 1982; Robinson-Wilson, 1977); microcomputer use (Frank, Wacker, Berg, & McMahon, 1985); and, purchasing from vending machines Nietupski, Clancy, & Christiansen, 1984). The following self-management procedures have been used in various combinations: Verbal instructions, modeling, gesturing, corrective feedback, verbal praise, and physical guidance. Common to the picture-prompt studies discussed was the sequential (consecutive) presentation of picture prompts.

Most picture-prompt studies designed to promote skill acquisition with persons with developmental disabilities have focused on teaching complex response chains, each composed of separate and distinct trials. Each trial is represented by one picture as a discriminative stimulus that requires one specific response. The application of forward chaining procedures (Heron, 1987) has resulted in the acquisition of complex behavior. This training, however, often results in the acquisition of responses that are context-dependent, (i.e., picture-prompt 2 always follows picture-prompt 1 and precedes picture-prompt 3, in the chain). In such training situations, the learners remain under the control of sequentially presented stimuli in a precise order. This precise order of responding might preclude the ability to respond appropriately to variable task demands that might be required in other settings, such as a workplace, where unexpected demands rarely follow a set sequence.

Sequentially presented pictures of tasks were used by Sowers et al. (1985) to train "job independence and flexibility." In their study, Sowers et al. used pictures of each of six tasks to be completed and a work-break presented sequentially on one page of a photo album. In the Sowers et al. study, the utility of picture prompts was extended from training task-specific response chains to using sequentially presented picture cues to train a novel response chain that can be used to manage several additional response chains.

MacDuff, Krantz, & McClannahan (1993) used sequentially presented picture prompts contained in photo albums (photographic activity schedules) to train independent management of multiple activities. In the MacDuff et al. (1993) study, each picture prompt (one page in a picture-activity schedule) represented one activity that was composed of a chain of individually distinct responses.

Picture prompts are stable discriminative stimuli that can remain available for a learner's future reference (Agran et al. 1989). The continuous availability of an established discriminative stimulus might, therefore, promote response generalization (Heward, 1987). The experimental and practical significance of generalization programming was well established when Stokes and Baer (1977) outlined and defined strategies to promote generalization. Kirby and Bickel (1988) provided a stimulus control interpretation of the generalization programming strategies recommended by Stokes and Baer by conducting an analysis of the fundamental learning principles responsible for the promotion of response generalization. According to Kirby and Bickel, generalization failure can be attributed to the absence, or only occasional presence, of the controlling stimuli in the novel circumstance to which the newly acquired response is expected to occur. Generalization can also fail to occur because the stimuli believed to be controlling a response are merely conditional, i.e., these stimuli will control a response given only certain sets of circumtances.

According to the Kirby and Bickel (1988) interpretation, generalization is a matter of stimulus control. Specification of the stimuli that control behavior in one situation, therefore, should enable the transfer of stimulus control over those responses to other tasks or settings (Cooper, 1987).

Antecedent cue-regulation, as a self-management strategy, is used to facilitate the transfer of stimulus control from an external source (e.g., prompts) to an internal source (e.g., self-managed behavior). When a self-management training program includes more than one component in the training procedure, any of the components, or combination of those components, can acquire control over behavior. For example, if self-recording procedures are combined with self-reinforcement and picture prompts, isolation of the stimulus, or stimuli, that exerts control over behavior would be impossible without including a plan to isolate and analyze treatment components prior to beginning the study. It is of critical importance, therefore, to specify the stimulus component, or components, that exert control over the target behavior (Martin et al. 1982; MacDuff et al. 1993).

Although picture prompts have been used with success in controlled environments, these prompts may not be effective in a complex work environment where work demands vary across dimensions, i.e., duration, order, complexity. To be an eligible candidate for competitive employment (Rusch & Hughes, 1989), workers must be able to deal effectively with the variation in demands that are common to most work environments. According to Rusch, Martin, & White, (1985) one of the reasons persons with developmental disabilities fail to maintain employment is an inability to maintain a continuous level of productivity in the absence of externally produced prompts. To function independently in a work setting, therefore, a person must possess an ability to self-mange or self-direct one's own behavior. In other words, to prepare a person for employment, it is necessary to effect a transfer of stimulus control over behavior from all externally produced prompts (e.g.,verbal) to prompts that are self-managed (e.g., picture prompts) by the potential employee.

In vocational training programs, picture-prompts have been used to teach a variety of skills to persons with developmental disabilities. These training programs have been used to promote acquisition of the following: Janitorial skills in a cafeteria (Agran et al. 1989); independent task changes in a cafeteria (Connis, 1979); independent time management in a cafeteria (Sowers, Rusch, Connis, & Cummings, 1980); cleaning tasks in a cafeteria (Sowers, Verdi, Bourbeau,

& Sheehan, (1985); complex assembly and packaging tasks (Wacker & Berg, 1983); clerical and laundry skills (Wacker, Berg, Berrie, & Swatta, 1985).

Three of the studies mentioned, are of particular interest in the present investigation (Connis, 1979; Sowers et al. 1980; and, Sowers et al. 1985). In each of these studies, an attempt was made to train independent movement from one task to another in a vocational setting.

In 1980, Sowers, Rusch, Connis and Cummings used picture prompts to train independent movement to and from breaks and lunch. The training procedure used in this study differed from those used in other picture-prompt studies. First, in the Sowers et al. (1980) study, all relevant training stimuli were represented on one card. The stimuli included four pictures of clock faces, each depicting the subject's assigned time to (a) go to break; (b) return from break; (c) go to lunch; and, (d) return from lunch. The subjects had to select one stimulus from the four available. That is, the subjects learned to match the hands on one of the four pictured clocks on the prompt card, to the time as it appeared on a real clock. These subjects learned a match-to-sample task. In other studies, prompting was sequential (Connis, 1979; Sowers et al. 1985; Wacker & Berg, 1983; Wacker et al. 1985); pictures were presented in sequence, or ordered, so that only one discriminative stimulus was available or appropriate to the task at one time. The task requirement in all other studies was, therefore, simple discrimination. Simple discrimination can be explained in terms of the three-term contingency (Catania, 1992). For example each picture-prompt trial includes (1) a stimulus; (2) an opportunity to respond; and, (3) a consequence, e.g., Discriminative stimulus (picture-prompt) - Response (perform task) - Consequence (feedback).

The subjects in the Sowers et al. (1980) study were trained to acquire a conceptual skill, while in all other picture-prompt studies concrete, motoric responses were taught. The subjects in the Sowers et al. study did not necessarily acquire the time concept, however, since no measure of generalization was made. According to Dinsmoor (1995), generalized responding is the only evidence that concept acquisition has occurred.

Connis (1979) used picture prompts to train adults with mental retardation to change tasks independently. Photographs of each task were taped to the wall in the exact order in which the tasks were expected to be performed. A blank square of paper was taped beneath each picture. To facilitate task completion and independent task changes, the subjects were trained to use four self-management steps: (a) approach photo (b) look at photo (in correct sequence); (c) mark X on paper; and, (d) begin task. The responses acquired in the Connis (1979) study maintained over 10 weeks. The study is noteworthy, in that picture prompts were used to train self-management techniques in a vocational setting. Connis (1979) reported having used the "Train and Hope" generalization programming strategy (Stokes & Baer, 1997). In addition, Connis (1979) reported that response generalization did occur, because the response maintained, even after partial withdrawal of the training package. The "Train and Hope" method is not a program for generalization (Stokes & Baer, 1977). What Connis (1979) described as response generalization was actually response durability. No specific measure of generalization was made in the Connis (1979) study. Of great interest is the fact that the subjects in the study continued to change tasks independently at very high rates at the 10-week follow-up, although their use of the four self-management procedures had declined dramatically. Perhaps the pictures continued to function as discriminative stimuli, even though the subjects had themselves "faded" their use of the self-management responses learned during training. For example, the subjects could have been merely glancing at the photos in sequence without using the self-management steps.

One of the three studies discussed, (Sowers et al. 1985), directly addressed the concept of "flexibility". Up until the Sowers et al. (1985) study, and with the exception of the study conducted by Sowers et al. (1980), all picture-prompt training in vocational settings involved teaching persons with developmental disabilities to make appropriate responses to stimuli that were always presented in a specific order. Task demands in a work setting, however, are not always made in order, and the task demands often vary, not only in order, but in frequency, and duration, as well.

Sowers et al. (1985) examined "independence and job flexibility" using picture cues and self-management strategies. "Flexibility" referred to a subject's demonstrated ability to make appropriate responses to novel sequences of stimuli. Sowers et al. used a multiple baseline design across students to measure the effectiveness of picture cues on promoting independent task change (beginning a task in sequence without a verbal prompt) with four students. To be scored as having made an independent task change, the students were required to complete four self-management steps during picture-cue training. The steps were (a) return to the picture of the completed task; (b) mark that picture; (c) touch the picture of the next task in sequence; and, (d) begin the task.

Photographs of six janitorial tasks and a break were randomly selected from two pools of 12 tasks each and arranged in an album for each subject. Single photo album sheets contained individual pictures of each of the seven tasks selected to be used for a session. Each sheet was attached to clipboard, and the students were provided with pens. All students demonstrated an ability to change tasks independently (begin a designated task without prompt). In addition, generalized responding to new sequences of picture cues (but not necessarily to novel stimuli) was demonstrated by all subjects.

Two of the subjects in this study were introduced to novel task pictures, (pictures of tasks that had not been used as probes during baseline or used during training). In addition, during the "generalization" phase, the students were trained to perform the novel tasks, and they received performance feedback. Because of their failure to include probes during baseline, and the use of training and feedback in the generalization phase, a conclusion that generalization occurred cannot be made in this study. Although Sowers et al. (1985) did report the occurrence of generalization in their study, they also included a qualifying statement, in which they reported that a conclusion that the students' responses were independent of stimulus control by the trainers could not be made. Sowers et al. recommended that a "self-control" package similar to the one they used, would be helpful in grooming persons with mental retardation to become marketable as employees in competitive employment, where they would need to demonstrate independent and flexible behavior. Perhaps a more practical definition of flexibility as a marketable skill for a job candidate, might be a demonstrated ability to make appropriate responses to multiple unexpected task demands, as found in real-life situations, such as workplaces.

Although generalization might be expected to occur as a natural result of picture-prompt training (Agran et al. 1989), past studies that used picture cues in vocational settings did not always measure generalization (Connis, 1979: Sowers et al. 1980). Of the studies that did report generalization occurrence (Agran et al. 1989; Sowers et al. 1985; Wacker & Berg, 1983; and, Wacker, Berg, Berrie, and Swatta, 1985), only two of those studies included specific generalization progamming in their procedure (Wacker & Berg (1983); Wacker et al. (1985).

Wacker and Berg (1983) used picture prompts to train complex task assembly, within a multiple-baseline design across five subjects and four tasks. Two tasks required assembly (red or black valves), while the other two tasks (circuit board and packaging) required color coding. One pair of tasks was used in training (one assembly and one color coding task), and the remaining pair was used to measure generalization. Separate picture books were used for each task. Each picture prompt included a picture of the part to be used and an illustration of how the part fit into the assembly. Generalization measures were obtained immediately following training. The novel tasks used to measure generalization were varied across subjects, and were presented under baseline conditions. All of the students demonstrated skill acquisition, and the response maintained for three of the students. With another three students, novel tasks were presented with picture prompts (Posttest 1) and without picture prompts (Posttest 2), and dramatic decreases in response occurred only after the picture prompts were withdrawn. Reinstatement of the picture books resulted in a return to previous high levels of response. Picture prompts were withdrawn abruptly without response decrement following training tasks. When picture prompts were withdrawn following generalization tasks, however, what resulted was substantial decreases in response levels, with one subject returning to baseline levels.

Wacker and Berg (1983) concluded that picture prompts are an effective tool to train complex assembly task steps that are performed in a sequential order. They suggested that future studies measure the effects of picture-prompt training across diverse tasks found in work settings.

To address the question of whether persons with mental retardation can generalize their use of picture prompts across diverse tasks (Wacker & Berg, 1983), Wacker et al. (1985) designed a study to measure the generalized use of picture prompts across diverse tasks. Wacker et al. (1985) used picture prompts to train three severely handicapped adolescents to complete complex vocational or daily living tasks. A multiple-baseline across subjects and tasks was used. Two settings were used, a classroom, and a school apartment. The tasks included: Dusting tables, cleaning windows, laundry folding, and conduit-assembly. Two different types of task were used to measure generalization. One of the tasks required the use of different materials from those used in training, but required similar motor responses to complete the task. The other task required materials and motor responses, both of which differed from those used in training tasks. For example, one subject was trained to fold laundry in the classroom, and the first task used to measure generalization was a slightly different laundry-folding task in the apartment. The second generalization task was conduit-assembly that required 29 steps to complete.

The results of the Wacker et al. (1985) study show that generalization across settings occurred for each of the subjects when similar tasks were used. Measures of generalization across dissimilar tasks showed that the subjects required significantly fewer sessions to be trained to complete the novel generalization tasks than had been required during skill acquisition training, a "savings effect" (Ebbinghaus' study (as cited in Keller & Schoenfeld, 1950). Generalization across dissimilar tasks did not occur.

The results of these two studies conducted in vocational settings (Wacker & Berg, 1983; Wacker et al. 1985) showed that generalization across settings and tasks occurred following picture-prompt training when similar tasks were used to measure generalization. The same results were not found, however, when dissimilar tasks were used (Wacker et al.).

Further experimental investigations should attempt to determine precisely what stimulus, or stimuli, account for the differences in stimulus control exerted through picture-prompt training with similar versus dissimilar tasks. Very few studies have attempted to isolate and specify discriminative stimulus control attribution to picture prompts during skill acquisition, maintenance, and response generalization. Martin et al. (1982) used a multicomponent self-management package that included picture cues to teach three mentally retarded adults to prepare complex meals independently. Martin et al. identified independent picture turning as the independent variable, and the percent of meal steps completed independently as the dependent variable. In their multiple-baseline design across subjects, Martin et al. used two experimental phases: The first phase was a training baseline (pre-instruction with instructional feedback) to create a basis for comparison of performance when picture recipe cards were introduced. The second phase was pre-instruction, instructional feedback, and picture recipe cards. Instructional feedback included praise for steps completed independently, and correction for errors (delivery of verbal or physical prompts). Photographs of each of the steps in a recipe were numbered and presented in sequence. A reversal condition, in which the picture recipe cards were withdrawn, was introduced for one subject. By using a training baseline, and by withdrawing the picture cues for one subject, Martin et al. were able to conclude that the picture cues exerted the most influence over behavior. The Martin et al. (1982) study is noteworthy because it is the only picture-prompt study that planned and designed an experiment that would permit isolation of the effects of the picture prompts.

In 1993, MacDuff et al. used a multiple-baseline design across participants to train four young men with autism to manage their after-school activities. In this study, MacDuff et al. made an important contribution to the picture-prompt research literature by using only graduated guidance with photographic activity schedules to promote acquisition, maintenance, and generalization of on-task and on-schedule behavior. Their results indicate that the target responses were acquired and maintained in the presence of randomized photograph sequences. The insertion of pictures of novel tasks into the activity schedules resulted in a demonstration of activity-following behavior. A claim of demonstrated generalization cannot be made, however, due to the absence of baseline probes in their study. The results of the MacDuff et al. study provide strong evidence to support the findings of Martin et al. 1982, namely, that picture prompts are extremely powerful discriminative stimuli and are useful in effecting the transfer of stimulus control from other-directed to self-directed responses. In addition, the MacDuff et al. study supports the findings of Sowers et al. 1985, namely, that the activity schedules controlled responding.

As powerful discriminative stimuli, picture-prompts are an attractive component for incorporation into programs designed to promote behavior change in persons with developmental disabilities. Before designing a research study that uses picture prompts, however, it is important that researchers specify the behavioral outcome they intend to promote. Although elementary to researchers, specificity is stressed here because of the distinction that exists between two types of picture-prompt training procedures. The two types of prompting are sequential picture prompt training and photographic activity schedules.

The application of sequential picture prompts is appropriate when skill acquisition is the desired behavioral outcome. Persons with developmental disabilities have acquired complex skills through self-management programs that include picture prompts. Many skills have been trained in a variety of settings. In vocational settings the following skills have been trained: assembly and packaging (Wacker et al. 1985); clerical and laundry (Wacker & Berg, 1983); independent task change (Connis, 1979); and, decision making (Agran et al. 1989). During picture-prompt training, each picture prompt functions as a discriminative stimulus for a specific response (e.g., one task step). The picture prompts are presented sequentially, and what is learned is a series of task-specific responses. As part of some training procedures, systematic prompt fading is included in the design. In the absence of picture prompts, the acquired skills might or might not maintain. If maintainence results, then the transfer of stimulus control from pictures to self-directed behavior has occurred. Stimulus control, however, exists only for the skill that had been trained. An accurate assessment of generalization following picture-prompted skill acquisition would require the presentation, under baseline conditions, of a novel picture-prompt sequence that corresponds to a novel task.

When photographic activity schedules are used in a successful training procedure, chains of responses are acquired, as well. The stimulus arrangement in these studies is also sequential, and the picture prompts are presented consecutively. The response chains that are learned, however, are not task-specific. Continued criterion performance, while photographs are randomly resequenced, demonstrates that the photographic activity schedule, or the sequences of task photographs, has become the discriminative stimulus for the independent management of activities (MacDuff et al. 1993; Sowers et al. 1985). Stimulus control by the photographic activity schedule was demonstrated. That is, each of the young men in this study used the schedule to manage his activities during picture re-sequencing and when pictures of novel activites were inserted.

The content of learning that results from each of these two types of picture-prompt training differs dramatically, depending on the response targeted for behavior change. For example, when picture prompts are used to promote skill acquisition, each step in a specific task is represented by one picture in the sequence. The content of that learning is a task-specific response chain. What results from using photographic activity activity schedules, however, is that the activity schedule itself becomes the discriminative stimulus for a chain of responses, in which each response is actually another chain of responses required to perform a specific task or activity (represented by one page in the schedule). Stimulus control by the photographic activity schedule is demonstrated by the learners' continued schedule following, regardless of the order in which the photographs are presented (MacDuff et al. 1993).

In the present study the literature was extended through the inclusion of an entirely new level of picture-prompt training. The types of picture-prompts introduced in the present study were used to promote a higher level of discriminative stimulus control than existing picture-prompt training procedures. The new prompts were contained in a self-managed pocket-prompt system, composed of unscheduled and scheduled task cards. The prompt system was designed to help maintenance workers to complete multiple, unexpected task demands and return to scheduled tasks within allotted times.

To date, no research has investigated the use of picture-prompt procedures to train persons with developmental disabilities directly to respond to task-demand variability (unexpected tasks) in a work setting. The purpose of the present study, therefore, was to train workers with developmental disabilities to use picture prompts to manage multiple, unexpected work interruptions in a work setting, and to maintain the use of those prompts in the absence of continuous supervision. In the past, these workers had been dependent on verbal prompts to complete unscheduled tasks and return to scheduled tasks within reasonable times. It was intended, therefore, that a discriminative stimulus (picture-prompt system) be designed that would help the workers monitor their own work performance, thereby decreasing their dependence on staff prompts to complete unscheduled tasks and return to scheduled tasks within allotted times.

Specifically, two types of task demands were placed on each worker: (a) while engaged in one of two scheduled tasks, workers were asked to complete one of four unscheduled tasks, and then to return to their scheduled task; (b) while engaged in the first unscheduled task (within 10 s), workers were asked to do a second unscheduled task when they finished the first unscheduled task, and then to return to the scheduled task. The first requirement (a), completion of one unscheduled task and a return to scheduled task (a One-Unscheduled Task Sequence) was the minor target response in this study. The main target response was the second requirement (b), the completion of two consecutive unscheduled tasks and a return to the scheduled task, (a Two-Unscheduled Task Sequence). Discriminative stimulus control, in the form of textual/pictorial cues arranged on binder rings, was used to create a pocket-prompt, self-managment system for the workers.

In contrast to the majority of past picture-prompt studies conducted in vocational settings, in the present study, several explicit strategies (Stokes & Baer, 1977) were combined to promote generalization (Heward, 1987). Specifically, (a) An attempt was made to take advantage of naturally occurring reinforcers available in work environments. For example, the workers knew what to do next, so their competence increased; they avoided being corrected and nagged by staff; and, they undoubtedly received occasional words of praise from supervisory staff; (b) Common stimuli were programmed; each task card represented a familiar task, and pretesting confirmed that each worker recognized all pictures as task representative; and, (c) Stimuli were designed to encourage generalization. For example, two unscheduled task cards not used in training were continuously present on the pocket-prompt system. Each scheduled task card contained two velcro dots to accommodate the attachment of two unscheduled task cards.

The present study extends the picture-prompt research literature in many ways: First, unlike the sequential (consecutive or successive) arrangement of picture prompts used in past studies, the arangement of picture prompts in this study was simultaneous presentation (i.e., all unscheduled tasks cards were available for selection at all times). Stimulus-specific responses to the instructions delivered (i.e. correct selection and placement of task cards), would indicate, therefore, that discriminative stimulus control over responding had been acquired by the pocket-prompt system. Further, it would demonstrate that the workers' responses to the task stimuli were not chained responses, but were stimulus-specific responses, i.e., specific stimulus (task card) selection was conditional upon specific instructions delivered.

Second, the task requirement in the present investigation (conditional discrimination) differs radically from the task requirement in prior picture-prompt studies. With the exception of the Sowers et al. 1980 study, in which the task requirement was conditional discrimination, all other picture-prompt studies used simple discrimination tasks. The subjects in those studies had to look at each picture prompt in sequence and complete the task that was illustrated on that page. The subjects then had to turn the page to a new task. One specific response was required for each discriminative stimulus. The subjects did not need to make a choice between two, or more, responses. By contrast, each worker in the present study was required to make a conditional discrimination for each particular task demand. That is, each worker had to select from a collection of picture cues those pictures (task cards) that were immediately relevant to both his scheduled and unscheduled task demands. In conditional discrimination, the status of one stimulus (e.g. the correct unscheduled-task card) depends (is conditional) on the status of another stimulus (e.g. specific unscheduled task required), (Catania, 1992). For example, in the present study, the workers' selection of an unscheduled task-card (its relevance) from the four available task cards was conditional on the specific unscheduled task he was asked to complete (status of instructional stimuli).

Third, unlike many previous picture-prompt studies that used multi-component treatment packages in vocational settings, an attempt was made in this study to isolate the effects of the pocket-prompt system.

The trainer used graduated guidance to prompt each worker's correct manipulation of picture prompts to monitor scheduled and unscheduled tasks. In a component analysis of their multicomponent treatment program designed to increase independent meal preparation by mentally retarded adults, Martin et al. (1982) determined that the major controlling variable used in their study was the picture prompts. In addition, MacDuff et al. 1993 isolated the effects of picture prompts by using only two components in their treatment package (photographic activity schedules and graduated guidance).

In the present study, only two components were used in training (physical prompting & fading and the pocket-prompt system), in replication of the two-component treatment package used by MacDuff et al. 1993. The present study differs from the MacDuff et al. (1993) study in the following ways: Population; setting; stimulus arrangement; and, task requirements. MacDuff et al. (1993) used graduated guidance to train young men with autism to used photographic activity schedules to manage leisure activities in a residential setting. The stimuli (photographs) used in that study were arranged as consecutive (sequential) pages in a book. The task requirement was simple discrimination.

By contrast, the present study was conducted in a workplace with persons with developmental disabilities. The arrangement of picture prompts used in the study was non-sequential (simultaneous). That is, all pictures on the pocket-prompt system remained continuously visible and available for selection. Beginning with hand-over-hand prompting, the workers in the present study were physically prompted from behind to select a specific unscheduled task card and place it onto a specific scheduled task card, depending on the task demand. Physical prompting was faded systematically, according to criterion performance.

Method

Participants and Setting

Three male maintenance workers with developmental disabilities participated in the study. The workers were 26, 29, and 47 years old at the beginning of the study. Worker 1 functions within the moderate range of mental retardation and reads on a second-grade level. Worker 2 functions within the mild range of mental retardation and reads on a kindergarden level. Worker 3 functions within the severe range of mental retardation, reads on a first-grade level, and wears corrective lens.

Workers 1, 2, and 3 have been regularly scheduled full-time maintenance employees of this workshop for five and one-half, eight, and six years, respectively. None of these workers had previous exposure to picture-prompt training. All workers had demonstrated competence in each of the required tasks, but all were dependent on supervisory staff instructions to sustain productivity and to return to scheduled tasks following completion of unscheduled tasks. All tasks used in the study are defined in the section headed Definitions.

All phases of the study were conducted in a large factory warehouse that is part of an agency that provides a variety of services, including sheltered employment, for persons with developmental disabilities. All experimental sessions were conducted each weekday between the hours of 11:00 a.m. and 1:00 p.m. During those hours, the workers' Scheduled tasks included Sweeping assigned areas within approximately 3,810 square cm of floor space, and Emptying Garbage (six 30-gallon pails), respectively.

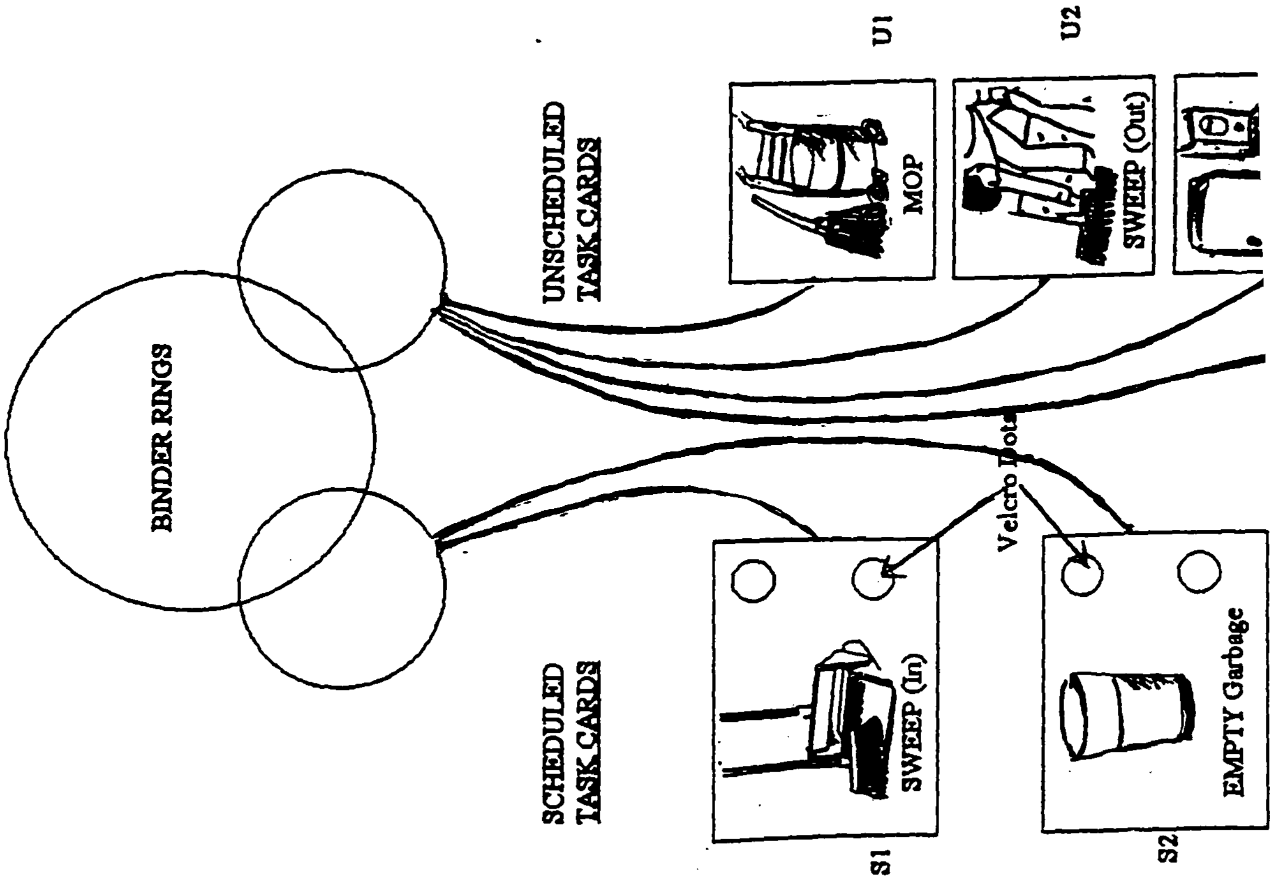
Materials

Figure 1 provides an illustration of the pocket-prompt system used by each worker during training, maintenance, and follow-up sessions. Each pocket-prompt system was composed of: (a) three binder rings (two were 3.8 cm in diameter, and one was 5.1 cm in diameter); (b) one 3.2 cm x 1.6 cm binder clip; (c) two 6.3 cm x 8.9 cm Scheduled Task cards (representing Sweep and Empty Garbage), made of white oaktag, each enclosed in a 7.6 cm x 10.2 cm vinyl sleeve, and each containing 2 velcro dots attached to the right outside corners; and, (d) four 3.8 cm x 6.3 cm Unscheduled Task cards, (representing Sweep (Outside), Mop, Refill Dispensers, and Vacuum). Each of these cards was made of colored oaktag, and each was laminated with one velcro dot on the back of the card.

Each task card included the printed name, as well as a pictorial representation, of one task. The two Scheduled Task cards were each held in a 7.6 cm x 10.2 cm vinyl sleeve that was hole-punched and attached to one of the small binder rings. Four Unscheduled Task cards were each tied to a separate 30.5 cm length of black nylon cord. The four lengths of cord were each tied, knotted, and connected to a small binder ring. Both small binder rings were connected to the large binder ring that was attached to the worker's belt loop.

During Fading I, the size of each of the task cards was decreased by half. Color was eliminated as a redundant cue during Fading II. Fading size and color made the pocket-prompt system less obtrusive and enabled each worker to store the entire pocket-prompt system in his pocket.

Figure 1. An illustration of the pocket-prompt system used to train maintenance workers to complete Unscheduled Tasks and return to Scheduled Tasks, within allotted times.


BINDER RINGS
UNSCHEDULED TASK CARDS
U1
MOP
U2
SWEEP (Out)
SCHEDULED TASK CARDS
S1
SWEEP (In)
S2
EMPTY Garbage
Velcro Dots

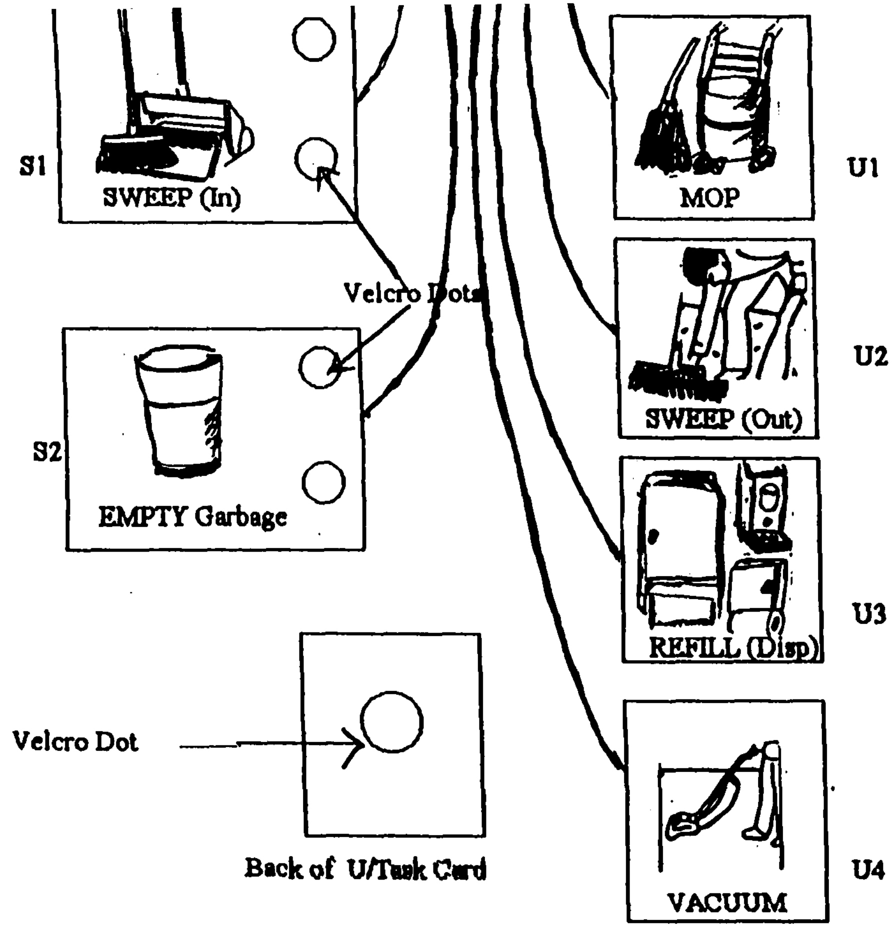

S1
SWEEP (In)
S2
EMPTY Garbage
Velcro Dots
Velcro Dot
Back of U/Task Card
U1
MOP
U2
SWEEP (Out)
U3
REFILL (Disp)
U4
VACUUM

Fig. 1

Definitions

Tasks were categorized as either Scheduled or Unscheduled. Scheduled tasks were those the workers were expected to perform each day. The tasks included: (a) Sweep Inside, and (b) Empty Garbage. Unscheduled tasks were tasks that were not part of the workers' daily routine. These tasks included: (a) Sweep Outside; (b) Mop; (c) Refill Dispensers; and, (d) Vacuum. For identification purposes, each task was assigned a letter-number representation. Scheduled tasks were labelled S1 and S2, and represented Sweep Inside and Empty Garbage, respectively; Unscheduled tasks were labelled U1, U2, U3, and U4, and represented Mop, Sweep Outside, Refill Dispensers, and Vacuum, respectively. Tasks U1 and U2 were used during training, and Tasks U3 and U4 were used to measure stimulus generalization.

The target response was an Unscheduled Task sequence, or response chain, that included all steps required for a worker to: (a) be interrupted from a Scheduled task; (b) collect the tools needed for an Unscheduled Task, or Tasks; (c) complete one or two Unscheduled Tasks (depending on instructions delivered); (d) return the tools used for the

Unscheduled Task, or Tasks; (e) return to the Scheduled Task in which he had been previously engaged; and, (f) resume work on the Scheduled task.

Unscheduled Task Sequences were categorized as either One- or Two-Unscheduled Task Sequences. In One-Unscheduled Task Sequences (the minor target response), a worker was required to complete one Unscheduled Task, while in a Two-Unscheduled Task Sequence (the main target response), a worker was required to complete two consecutive Unscheduled Tasks and then to return to his Scheduled Task. Instructions for a worker to complete the second Unscheduled Task were delivered within 10 s of the worker's engagement in the first Unscheduled Task. For each of the steps in both One-Unscheduled and Two-Unscheduled Task Sequences, allotted times were assigned. (See Appendix A for predetermined times allotted for task-sequence steps).

Specifically, while engaged in either Scheduled Task (Sweep Inside or Empty Garbage), a worker would be instructed to interrupt his work, to Mop an area inside the workshop, or to Sweep outside the workshop. In Table 1, a brief description of the steps required to complete One-Unscheduled Task Sequences (7 steps) and Two-Unscheduled Task Sequences (11 steps) is presented.

Table 1

Steps Required to Complete One-and Two-Unscheduled Task Sequences

Sx = Scheduled Task

Ux = Unscheduled Task

One-Unscheduled Task Sequence: (7 steps)

1. STOP doing Scheduled Task;
2. GET tools for Unscheduled Task (e.g. Mop (U1);
3. GO TO site of Unscheduled Task (e.g., U1 Mop site);
4. COMPLETE Unscheduled Task;
5. RETURN task tools; (e.g., Mop);
6. RETURN to Scheduled (S1 or S2) Task; and,
7. RESUME work on Scheduled (S1 or S2) Task.

Two-Unscheduled Tasks Sequence: (11 steps)

Do Steps 1 - 5 above plus:

6. GET tools for 2nd Unscheduled Task (e.g. U2);
7. GO TO site of 2nd Unscheduled Task (U2 Sweep site);
8. COMPLETE 2nd Unscheduled Task (U2 Sweep Out);
9. RETURN task tools (e.g. U2 Broom);
10. RETURN to Scheduled (S1 or S2) task; and,
11. RESUME work on Scheduled (S1 or S2) task.

Dependent Measures

For each worker, the dependent measures recorded during baseline and treatment (pocket-prompt training & fading) were: (a) overall percentage of Task-Sequence steps completed within allotted times for both One- and Two-Unscheduled Task Sequences; (b) overall percentage of trials in which the workers' travelled from the site where the tools used to for the first unscheduled task were returned and arrived at the site of the second Unscheduled task (Two-Unscheduled Task Sequences only); (c) overall percentage of Returns-to-Scheduled-Tasks within allotted times following Unscheduled task completions for both One- and Two-Unscheduled Task Sequences; and, (d) completion of Unscheduled tasks within allotted times.

For each worker, and for each task-sequence step, the number of seconds that elapsed was measured, recorded, and compared with the predetermined allotted times. (Appendix A)

Independent Measures

A pocket-prompt system (Figure 1) was given to each worker during pretraining. Two Scheduled (S) task cards (Sweep Inside and Empty Garbage), and four Unscheduled (U) task cards (Mop, Sweep Outside, Refill

Dispenser, and Vacuum) were used.

While using the pocket-prompt system, each worker's accurate completion of each required step and the number of seconds required to complete each step were measured. Four pocket-prompt steps were required to complete a One-Unscheduled Task Sequence, and 8 pocket-prompt steps were required to complete a Two-Unscheduled Task Sequence. Listed in Table 2 are the steps required to use the pocket-prompt system to complete both One- and Two-Unscheduled Task Sequences.

Table 2

Steps Required to Use the Pocket-Prompt System

U/Task - Unscheduled Task   S/Task - Scheduled Task

U/Task Card - Unscheduled Task Card

S/Task Card - Scheduled Task Card

One-Unscheduled Task Sequence: (4 steps) (5-s latency)

a. PICK UP POCKET-PROMPT;

b. SELECT the appropriate U/Task Card (U1 or U2);

c. STICK the U/Task Card onto S/Task Card; and,

d. REMOVE U/Task Card from S/Task Card.

Two-Unscheduled Task Sequence: (8 steps) (5-s latency)

a. PICK UP POCKET-PROMPT;

b. SELECT the appropriate U/Task card (U1 or U2);

c. STICK the U/Task Card onto S/Task Card; and,

d) PICK UP POCKET-PROMPT for 2nd Task instructions;

e) SELECT appropriate U/Task Card for 2nd U/Task;

f) STICK 2nd U/Task Card on S/Task Card;

g) REMOVE 1st U/Task Card from S/Task Card; and,

h) REMOVE 2nd U/Task Card when tools are returned.

Experimental Design

A multiple-baseline design across three workers was used to measure the effects of graduated guidance and a pocket-prompt system on maintenance workers' percentage of returns to scheduled tasks following interruptions by staff requests to complete unscheduled tasks while workers were engaged in a scheduled task. Experimental conditions included: Baseline, Pocket-Prompt Training & Fading, Maintenance, and Follow-up.

During baseline, the workers were asked to do one or two unscheduled tasks while working on a scheduled task. No pocket-prompt system was available to the workers. No informative feedback was provided. During Pocket-Prompt Training & Fading, the workers were given a pocket-prompt system to be used to keep track of any unscheduled tasks they needed to do, and to remind them to return to their scheduled task when the unscheduled task, or tasks, was done. During Maintenance and Follow-up, the workers continued to use the pocket-prompt system.

Observer Training

Under the supervision of the experimenter, two male staff alternated responsibilities with the experimenter for carrying out the procedure and acting as independent observers. One staff member holds a B.A. in Psychology and has been working in the workshop for the past three years as a job coach/counselor. The other staff has a high school diploma and is presently enrolled in a local college on a part time basis. He has been employed by the agency for the past four years as the maintenance supervisor.

Prior to baseline data collection, both observers participated in five training sessions. During those sessions, they learned the response definitions, learned to use the response codes and data collection instruments, and received detailed instructions regarding the observation and recording procedures. (See Appendix B for onset/offset criteria used to measure discrete tasks).

Short-answer tests were given to the observers to assess their knowledge of the response definitions of task sequences, the response codes, and the observational system. The mastery criterion for testing was 100%. (See Appendix C for sample observer examination). In addition, each observer was required to achieve an interobserver agreement criterion of 80% with the exprimenter for each task-sequence step measured, for three consecutive sessions, prior to collecting actual data.

Data Collection

Data were collected on individual sheets for each worker and for each cycle. (See Appendix D for sample data sheets). Each task-sequence step was numbered, and the predetermined allotted time for that step was circled next to the space on which the cumulative response latency was to be recorded. Scheduled Tasks, S1 and S2, represented Sweep Inside and Empty Garbage, respectively; Unscheduled Tasks, labelled U1, U2, U3, and U4, represented Mop, Sweep Outside, Refill Dispensers, and Vacuum, respectively.

The worker's accurate completion of each Pocket-Prompt System step within the required 5-s response latency was recorded on the same data sheet that was used to record the completion of each of the task-sequence steps for a cycle. For example, during the first training session, the prompt level for "Hand" would be circled, indicating that the prompt level in effect was hand-over-hand. No response latencies were measured for a worker's use of the prompt system until manual guidance was faded. For each consecutive session in which the worker achieved 100% accuracy on the completion of task-sequence steps, the prompt level was decreased systematically and indicated as such on the data sheet.

For each session after which manual guidance had been faded, the percentage of pocket-prompt system steps completed accurately within the required 5-s response latency was measured and recorded on the data sheet used for that cycle. Listed on each data sheet were each of the steps required to use the pocket-prompt system, while completing One-Unscheduled Task Sequences (4 pocket-prompt steps) and Two-Unscheduled Task Sequences (8 pocket-prompt steps).

In addition to being used to collect task-sequence step data for each cycle, each data sheet served as a checklist for the experimenter and the two observers to record the application of prompts. (Appendix D)

For each task combination in a given task sequence, one data collection sheet was used that included all the predetermined response latencies for each step of that particular task sequence. (See Appendix E for all task combinations used for training and for probe sessions).

During baseline, each worker's generalized use of novel unscheduled task cards (task cards not to be used in training), as well as each worker's completion of two consecutive unscheduled tasks (not to be trained) were measured individually. In addition, 20 probes were used in baseline that included all possible task combinations that would require both the use of two unscheduled task cards that were not to be used during training (novel task cards), as well as the completion of two consecutive unscheduled tasks that would not be trained. The entire complement of probes was presented to each worker once during baseline, twice during Pocket-Prompt Training & Fading, and once during Follow-up.

During each experimental condition, each worker's response time in seconds was recorded for each of the steps in a given task sequence four times (cycles) per session for each worker. At the beginning of each day, the experimenter and/or observers placed four data sheets for each worker on a clipboard. Each set of data sheets contained the specific task combinations that had been assigned randomly to be used for that worker.

On each data sheet, the steps required to use the pocket-prompt system were also listed. Each pocket-prompt system step had a 5-s response latency requirement. For One-Unscheduled Task sequences, four steps were listed (a through d); for Two-Unscheduled Task sequences eight steps were listed (a through h). Those data were collected along with the task sequence data and in the same manner. Each worker was required to complete each task-sequence step within the predetermined allotted time for that step to be scored correct.

During those sessions in which interobserver reliability was measured, an observer carried an identical set of data sheets and clipboard, and used a stopwatch to measure response latencies independently.

Random Assignment

At the beginning of each day, a table of random numbers was used to select specific assignment of each of the following conditions: (1) One-Unscheduled Task Sequence combinations; (2) Two-Unscheduled Task Sequence probes; (3) One-Unscheduled Task Sequence probes; (4) Two-Unscheduled Task Sequence probes using novel task cards; and, (6) experimenter/observer assignment for those sessions in which interobserver agreement was measured. In ordering task combinations, the Scheduled tasks always preceded any and all Unscheduled tasks, so that the workshop schedule could be maintained. That is, S1 always preceded S2. All

Unscheduled (U) tasks, however, were assigned to both S1 and S2 randomly.

Reliability

Interobserver agreement measures were obtained for 43% of all sessions. A point-by-point agreement method (Kazdin, 1982) was used to calculate interobserver agreement. During sessions in which reliability was measured, the experimenter and an independent observer simultaneously and independently recorded all occurrences and nonoccurrences of task-sequence steps completed within allotted times. An agreement was counted when both observers recorded the occurrence or nonoccurrence of a task-sequence step completed with the allotted time. A disagreement was counted when one observer recorded the occurrence of a worker's completion of a step within the allotted time, while the other observer recorded the nonoccurrence of the worker's completion of a step within allotted time. Reliability was calculated by dividing the number of agreements by the number of agreements plus disagreements, and multiplying by 100. Interobserver agreement was 93.82%, with a range of 82.00% to 100%, for all workers across all conditions.

Using the same measurement and scoring procedures as used to measure the percentage of task-sequence steps completed within allotted times, the percentage of pocket-prompt system steps completed within allotted times was measured for each worker. For approximately 30% of those sessions, a second independent observer recorded the occurrence and nonoccurrence of pocket-prompt system steps completed within 5 s for all workers. Agreements were divided by agreements and disagreements and multiplied by 100. Interobserver agreement for pocket-prompt system steps completed within allotted times was 99.27% with a range of 94.00% to 100%.

General Procedure

Each session included four cycles. Each cycle included one opportunity for a worker to be interrupted from engagement in one of two Scheduled Tasks to do an Unscheduled Task or tasks. A cycle began with instructions to the worker to leave his Scheduled task and do one of the Unscheduled tasks. The Scheduled tasks were Sweep Inside (S1), and Empty Garbage (S2). Unscheduled Training Tasks were: Mop (U1), and Sweep Outside (U2). Unscheduled Probe Tasks were: Refill Dispensers (U3), and Vacuum (U4).

Under the direction of the experimenter, two supervisory staff acted as experimenter and/or observers throughout the entire study. The instructions for a worker to leave a Scheduled Task, get tools, complete an Unscheduled Task, and then return to a Scheduled task, were always delivered by one of these two staff.

For One-Unscheduled Task Sequences, a worker was instructed to interrupt his work on either of the two Scheduled Tasks; to collect the tools needed for an Unscheduled Task; to complete the Unscheduled Task; to return the tools used; and, to return to and resume working on the Scheduled Task.

For Two-Distractor Task Sequences, a worker was instructed to interrupt his work on a Scheduled task to do an Unscheduled Task. Within 10 s of the worker's engagement in the first Unscheduled task, however, additional instructions were delivered for the worker to complete yet another Unscheduled Task, after completing the first Unscheduled Task, to return any tools used, and to return to and resume working on his Scheduled task.

Baseline. During baseline, each session always included four cycles or opportunities for a worker to complete either a One-Unscheduled Task Sequence, or a

Two-Unscheduled Task Sequence, depending on what instructions were delivered. Requests to perform Unscheduled Tasks were delivered to a worker while he was engaged in one of his two Scheduled Tasks by one of the two supervisory staff. No informative feedback was provided, and no self-management, pocket-prompt system was available to the workers.

Pretesting. Immediately following baseline, each worker was invited to attend individual training sessions with the experimenter. The experimenter and the worker sat next to each other at the short end of a conference table. Ten flash cards, each measuring 12.69 cm x 17.77 cm, were placed upside down in a pile in front of the worker. Each card contained both printed word(s) and a pictorial representation of one task, tool, or work-related object (See Appendix F for pictures of flash cards). Instructions to the worker were read verbtim from a printed script (See Appendix G for instructions used). Each flash card was held up in front of the worker for 15 s. During pretesting session 1, if a worker did not emit a correct response within 15 s, the card number was noted, and an incorrect response was recorded. The experimenter presented the next card from the pile without comment.

Beginning with pretesting session 2, an incorrect response resulted in the naming of the card by the experimenter. The card was returned to the pile, and the response was marked incorrect. Each pretesting session included four cycles (presentations of 10 cards in random order). Presentations of 10 cards were repeated, and errors were corrected, until the mastery criterion of 100% accuracy for one session was achieved.

Pretraining. In pretraining, the experimenter gave individual demonstrations to each worker of each of the parts of the pocket-prompt system, and told them how to use the task cards on the system to keep track of their task demands. Rationales for using the pocket-prompt system were also delivered to each worker. In addition, each worker was instructed to put the binder clip onto a scheduled task card, and to take a small task card and stick that card onto the scheduled card with the clip on it. The experimenter read from printed instructions (Appendix G).

Pocket-Prompt Training & Fading. Immediately preceding the first training session, each worker was asked to hook the large binder ring on the pocket-prompt system onto his belt loop, and general instructions were read before the first training session only (Appendix G). As soon as the session began, no further discussion between the trainer and worker occurred.

Most-to-least prompting was used to train each worker to use the pocket-prompt system to monitor his work performance. Manual guidance, delivered from behind and just to the right of each worker's right arm, were used to prompt his manipulation of the task cards on the pocket-prompt system.

Training began with hand-over-hand prompting and was faded systematically as long as responding was at 100% for one session. As long as the worker continued to achieve mastery, the location of subsequent physical prompts was faded in the following order: Wrist, Elbow, and Shoulder. After manual guidance was faded, experimenter proximity was faded in the following order: (1) 30.48 cm, (2) 60.96 cm, (3) 91.44 cm, and, (4) 121.92 cm. The mastery criterion for fading experimenter involvement was 100% of task-sequence steps completed within allotted times for at least one session (four cycles, or opportunities to complete a task sequence).

Other than those instructions for a worker to complete an Unscheduled task, or tasks, return any tools used, and then return to the Scheduled task, no verbal instructions were delivered to the workers. The instructions to complete the first Unscheduled Task were delivered at the beginning of a cycle. Instructions for a worker to complete a second Unscheduled Task were delivered within 10 s of a workers engagement in the first Unscheduled Task for Two-Unscheduled Task Sequences. The mastery criterion during the Pocket-Prompt Training & Fading condition was one session (four consecutive cycles) at 100% accuracy.

Correction Procedure

Although it was not necessary to apply the correction procedure in this study, the plan included the delivery of a gestural prompt (point to card) after the worker's first error in using the first Pocket-Prompt System. A worker's second consecutive failure to make the appropriate response would have resulted in a return to the last physical prompt level that produced a correct response. If necessary, a remediation plan would have been used that included additional training with one of the Unscheduled Tasks that had not been used in training. Each of the workers in the study demonstrated a level of competence throughout training, fading, and during probe sessions that did not require remedial training.

Generalization

Generalization was planned through the following program applications: First, during pocket-prompt training & fading, maintenance, and follow-up phases, the workers did not receive performance feedback or contingent reinforcement for using the pocket-prompt system. It was planned instead to take advantage of naturally occurring reinforcers in the environment, such as the workers learning what comes next; the occasional praise likely to be delivered by staff intermittently; and, the avoidance of criticism and nagging by supervisors. Second, antecedent stimuli (pocket-prompt system task cards) were arranged to promote the development of a direct relationship between the task cards and the tasks, i.e., the pocket-prompt system task cards represented pictures of regularly scheduled tasks that were readily identified by each worker. In addition, the pocket-prompt system was used in the actual work environment and during the workers' engagement in regularly scheduled tasks. Finally, a discriminative stimulus likely to promote generalization was designed. That is, two of the Unscheduled Task cards on the pocket-prompt system were available to the workers, but were not used in training (Refill (U3) and Vacuum (U4). In addition, each of the Scheduled Task Cards contained two velcro dots to accommodate two Unscheduled Task Cards, even though the workers were trained to complete only one Unscheduled Task per sequence.

Generalization probes measured each worker's percentage of completion of two consecutive Unscheduled Tasks and his return to his Scheduled Task within allotted times. Both novel task probes (Refill and Vacuum) and novel response probes (two consecutive requests to do Unscheduled Tasks) were measured three times for each worker during baseline. In addition, 20 probes that measured both novel task card use and novel responses were used once during Baseline, twice during Pocket-prompt Training & Fading, and once during Follow-up sessions. For example, while a worker was Sweeping inside (S1), instructions to Vacuum (U4) could be delivered, followed by instructions to Mop (U1), making the task sequence S1/U4/U1. U4 would be the first Unscheduled Task, and U1 would be the second Unscheduled Task in that task sequence. The mastery criterion for probe sessions was 90% task-sequence steps completed within allotted times.

Fading

During Fading I all of the task cards on the pocket-prompt system were decreased in size by half. The mastery criterion for Fading I was four consecutive cycles (one session) at 100% accuracy. During Fading II, color was removed as a redundant cue. All task cards remained the same size as those used during Fading I, but the unscheduled task cards were white, rather than colored. The mastery criterion for Fading II was 100% for 4, consecutive cycles (one session).

Maintenance

During maintenance each worker carried his pocket-prompt system. Instructions to complete one of the two Unscheduled tasks, (U1 or U2) were delivered to the worker during his engagement in one of the two Scheduled (S1 or S2) Tasks. Data were collected on (a) each worker's overall percentage of One-Unscheduled Task Sequence steps, and (b) each workers overall percentage of pocket-prompt system steps completed within 5 s. No performance feedback was provided to the workers. The mastery criterion for maintenance was 90% completion of task-sequence steps.

Follow-up

One month after Worker 3 completed the maintenance phase to criterion, five follow-up sessions were conducted with each of the workers. During these sessions, the following measurements were taken for each worker: (a) overall percentage of Two-Unscheduled Task Sequence steps completed within allotted times, and (b) the percentage of pocket-prompt system steps completed within 5 s. Each worker was assigned four complex probe task combinations per session over five days. The mastery criterion was two consecutive sessions at 90% or better. Even if the mastery criterion was met within the first two days of follow-up, all probes were presented to each worker for five days. This measure insured that worker's responses were not dependent on any specific task combination.

Results

As illustrated in Figure 2, during baseline, each of the workers percentage of task-sequence steps completed within allotted times was less than 54.00%. The workers' overall percentage of steps completed in One-Unscheduled Task Sequences in baseline was 51.29%, compared with 96.25% during Pocket-Prompt Training & Fading, an increase of 44.96%. A dramatic increase in the percentage of task-sequence steps completed to criterion by each worker occurred within no more than five sessions after the pocket-prompt system was made available. (Figure 2)

On the main target response (Two-Unscheduled Task Sequences), each worker completed two consecutive Unscheduled Tasks and returned to Scheduled Tasks within allotted times. A comparison between baseline and Pocket-Prompt Training & Fading conditions of the task-sequence steps completed within allotted times for Two-Unscheduled Task probes, shows that the overall percentage of task-sequence steps completed during baseline was 46.54%, compared to 98.76% during treatment, an increase of 52.22%.

Figure 2. A multiple-baseline across subjects design used to evaluate the effects of graduated guidance and a pocket-prompt system on maintenance worker's completion of unscheduled tasks and returns to scheduled tasks. One-Unscheduled Task Sequences were represented by solid dots. Open triangles represented One-Unscheduled Task probes (Unscheduled Tasks not used in training); open squares represented Two-Unscheduled Task probes (two consecutive tasks); and, open circles represented probes that measured Two-Unscheduled Task Sequences than included untrained Unscheduled Tasks).

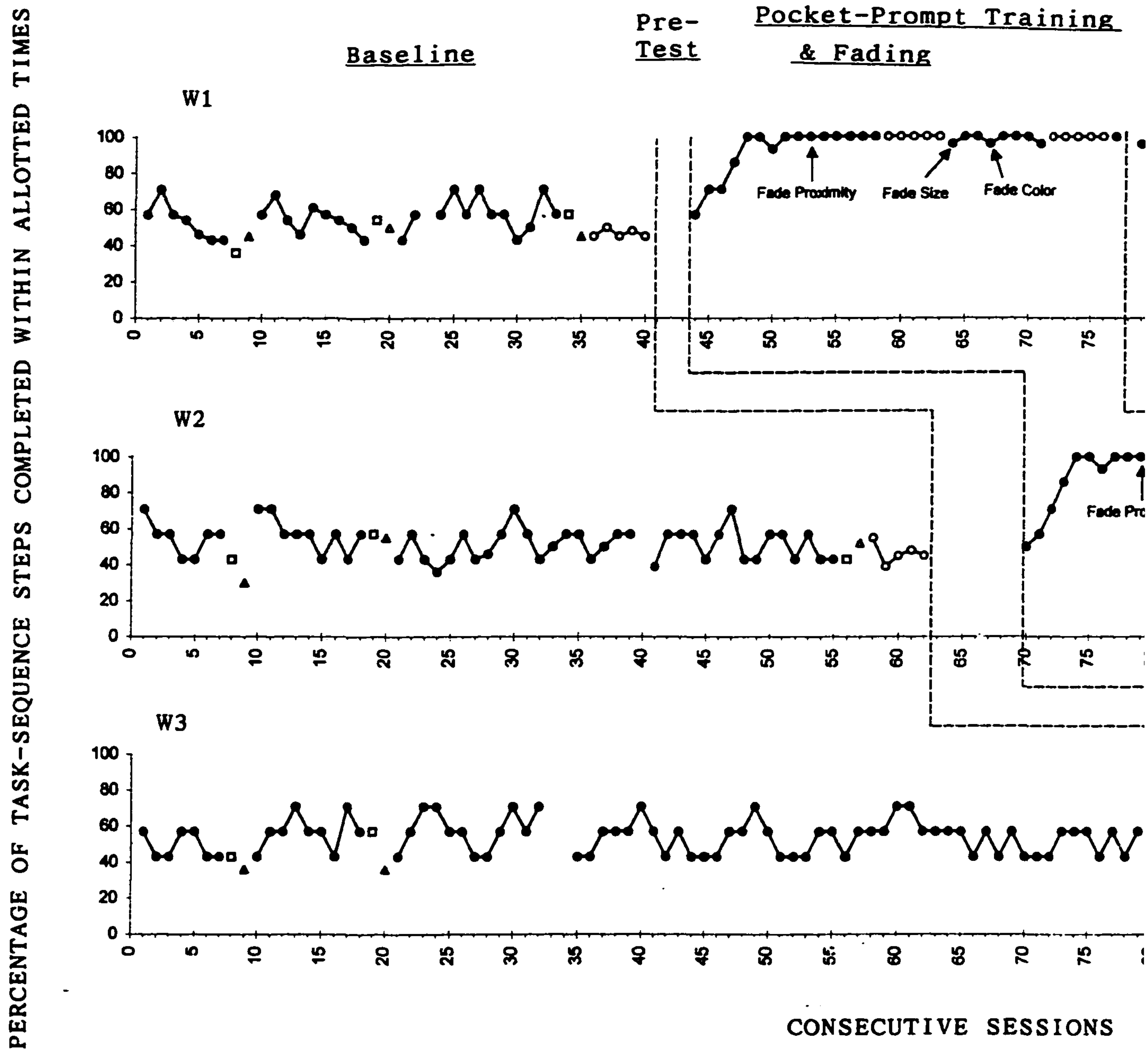
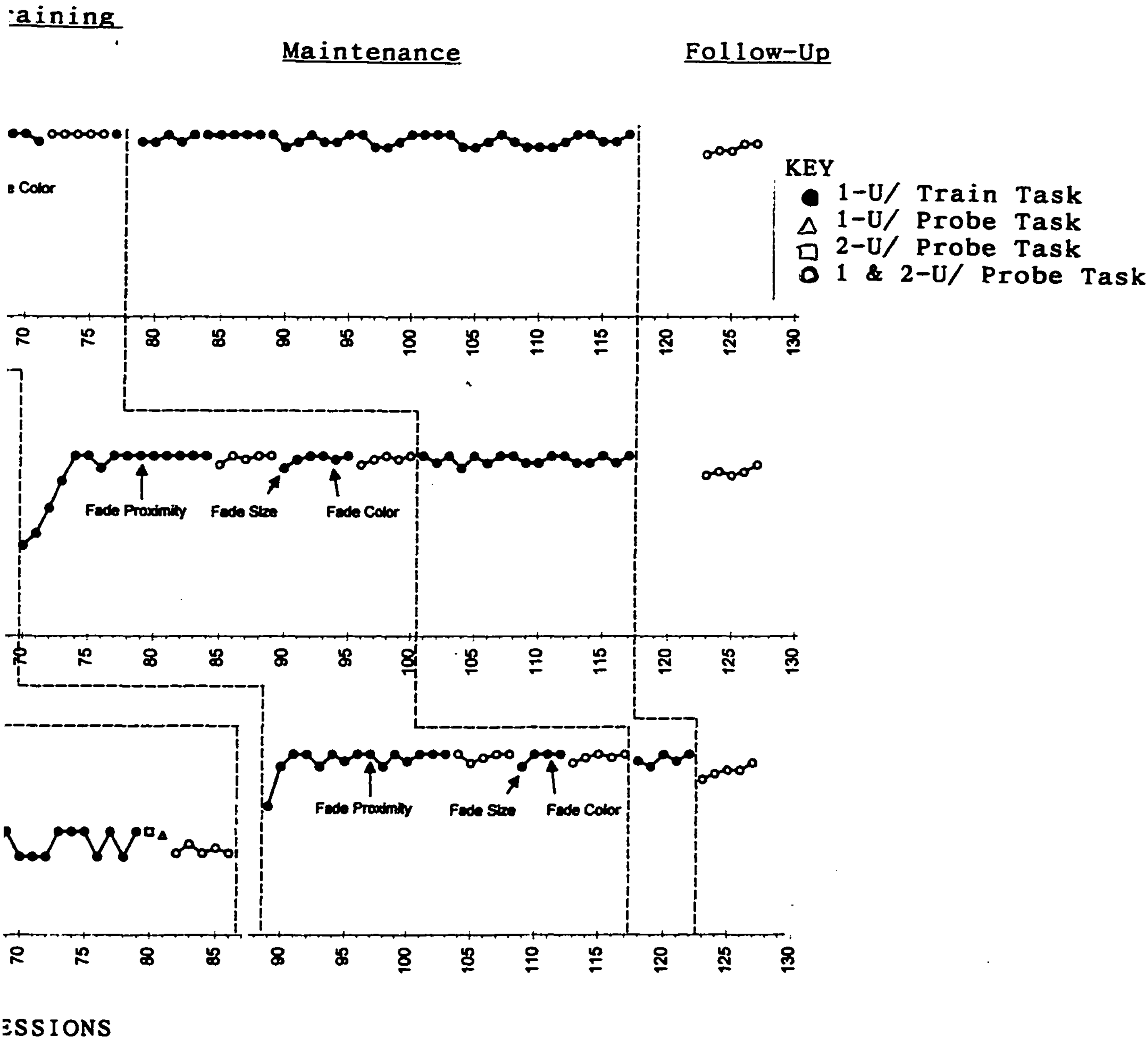

Baseline
Pre-
Test
Pocket-Prompt Training
& Fading
W1
W2
W3
Fade Proximity
Fade Size
Fade Color
PERCENTAGE OF TASK-SEQUENCE STEPS COMPLETED WITHIN ALLOTTED TIMES
CONSECUTIVE SESSIONS

Fig. 2


:aining
Maintenance
Follow-Up
KEY
1-U/ Train Task
1-U/ Probe Task
2-U/ Probe Task
1 & 2-U/ Probe Task
e Color
Fade Proximity
Fade Size
Fade Color
70
75
80
85
90
95
100
105
110
115
120
125
130
ESSIONS

Baseline

Baseline data show that the overall percentage of task-sequence steps completed within allotted times by all workers during baseline was 51.29%. No ascending trends were evidenced in baseline data for any of the workers.

For One-Unscheduled Task Sequence probes, the overall percentage of task-sequence steps completed within allotted times by the workers during baseline was 43.08%. The overall percentage of One-Unscheduled Task Sequence steps completed within allotted times by all workers during baseline was 46.58%.

Pretesting/training

Although data were not reported in Figure 2, during Pretesting/training, each worker was tested for picture recognition with each of the pictures that would be used in the study, as well as with four other work-related pictures. The mastery criterion was four consecutive cycles (4 presentations of ten flash cards) at 100% accuracy. Mastery was achieved by Worker 1 in three sessions; by Worker 2 in seven sessions; and, by Worker 3 in two sessions.

Pocket-Prompt Training & Fading

Worker 1. The percentage of steps completed within allotted times by Worker 1 (Fig. 2) in One-Unscheduled Task Sequences was 96.30% during Pocket-Prompt Training & Fading, compared to 53.57% during baseline, an increase of 42.73%. When experimenter proximity was faded (session 53), no decrement in response was evidenced. During Fading I (size of task cards), the percentage of task steps completed within allotted times by this worker dropped slightly to 96.00% (session 64). During Fading II (color faded), his percentage of task sequence steps completed within allotted times dropped again to 96.00% (session 67). In each case, the response decrement quickly recovered (within one session), and Worker 1 continued to maintain a high response level.

During Pocket-Prompt Training & Fading, the task-sequence steps completed to criterion on the main target response (Two-Unscheduled Task Sequences), for Worker 1 was 99.50%, compared to 46.60% during baseline, an increase of 52.90%.

Worker 2. The percentage of task-sequence steps completed to criterion by this worker for One-Unscheduled Task Sequence during Pocket-Prompt Training & Fading was 95.52%, compared to 46.42% during baseline, an increase of 49.10%.

When experimenter proximity was being faded, (session 79) Worker 2 continued to respond at 100%. When size was faded (session 90), Worker 2's percentage of task-sequence steps completed to criterion dropped to 93.00%, but recovered to 100% in the following session. When color was faded (session 92), this worker maintained his ability to complete task-sequence steps to criterion at 100%.

The percentage of task-sequence steps completed within allotted times for Two-Unscheduled Task Sequences during Pocket-Prompt Training & Fading was 98.20%, compared to 46.42% during baseline, an increase of 51.88%.

Worker 3. The percentage of task-sequence steps completed within allotted times in One-Unscheduled Task Sequences for Worker 3 was 96.93% during Pocket-Prompt Training & Fading, compared to 53.89% during baseline, an increase of 43.04%.

When experimenter proximity was being faded, a decrease in percentage of task-sequence steps completed to criterion to 93.00% was demonstrated by Worker 3 on two occasions. The first response decrease occurred when experimenter proximity was 60.96 cm (session 98), and the second decline in response occurred when experimenter proximity was 91.44 cm (session 100). On both occasions, Worker 3 achieved criterion performance within one additional session at the same proximity.

When the errors occurred, a decision to deliver corrective gestural prompts was followed by a decision to maintain proximity for one session before reverting to physical prompting. These decisions, although not planned, were made due to the type of errors made by this worker. In session 98, Worker 3 failed to complete task-sequence steps within allotted times, because he stopped to assist a fellow worker who had dropped several hundred items from a large carton. His response recovered to 100% in the following session. In session 100, this worker made errors when the Executive Director ventured into the workspace and observed his behavior. Throughout the entire study, Worker 3 made repeated offers of assistance to staff and peers.

When task-card size was faded (sesion 109), Worker 3's percentage of task-sequence steps completed to criterion dropped to 93.00%. Recovery to 100% was swift, within one session. When color was faded (session 111), the percentage of steps completed to criterion by Worker 3 was 100%.

Worker 3's percentage of steps completed to criterion for Two-Unscheduled Task Sequences during Pocket-Prompt Training & Fading was 98.60%, compared to 46.6% during baseline, a percentage increase of 51.8%.

Reliability

Table 3 contains the overall percentages of interobserver agreement for each worker under baseline, physical prompting & fading, maintenance, and follow-up conditions. In Table 4, the interobserver reliability measures of the percentage of pocket-prompt system steps completed for each worker are reported.

Table 3

Reliability Measures for Task-Sequence Steps

WORKER 1

Baseline	Treatment	Maintenance	Follow-up
89.60%	88.78%	93.82%	97.67%
Range			
82 - 100%	82 - 100%	86 - 100%	95 - 100%

WORKER 2

Baseline	Treatment	Maintenance	Follow-up
92.71%	94.00%	94.75%	97.00%
Range			
86 - 100%	82 - 100%	86 - 100%	93 - 100%

WORKER 3

Baseline	Treatment	Maintenance	Follow-up
90.41%	92.81%	95.00%	99.33%
Range			
82 - 100%	82 - 100%	93 - 96%	98 - 100%

Table 4

Reliability Measures for Pocket-Prompt System Steps

WORKER 1

	Treatment	Maintenance	Follow-up
	97.66%	100.00%	98.95%
Range	94 - 100%	100 - 100%	97 - 100%

WORKER 2

	Treatment	Maintenance	Follow-up
	100.00%	100.00%	98.95%
Range	100 - 100%	100 - 100%	97 - 100%

WORKER 3

	Treatment	Maintenance	Follow-up
	99.40%	98.50%	100.00%
Range	97 - 100%	97 - 100%	100 - 100%

Maintenance

During maintenance, each worker continued to use the pocket-prompt system to monitor his performance. Each of the workers continued to complete more than 90% of task-sequence steps within allotted times. The overall percentage of One-Unscheduled Task Sequence steps completed to criterion for all workers during Maintenance was 97.35%. Individual percentages for workers 1, 2, and 3 during maintenance were 97.13%, 97.94%, and 97.00%, respectively.

Follow-up

During Follow-up sessions (one month after completion of the study), each worker met the mastery criterion of two consecutive sessions of 90% or better. Although each of the workers was able to meet the 90% mastery criterion in less than five sessions, the full complement of probes was presented to each worker. This measure verified that the workers' demonstrated mastery was not contingent upon any particular task combinations. The workers' overall percentage of Two-Unscheduled Task Sequence steps completed within allotted times during Follow-up sessions was 91.46%. Individual percentages for workers 1, 2, and 3 were 92.20, 91.80, and 90.40, respectively.

Error Analysis

An analysis of the pocket-prompt system errors made by the workers is presented in Table 5.

The percentages of error per step opportunity by each worker are listed in Table 6. This measure includes the number of times a worker did not complete a pocket-prompt step accurately within 5 s divided by the total opportunities he had to perform that step. A visual inspection of these data shows that most pocket-prompt errors occurred on steps a, d and h. An error on Step a indicated a failure to pick up the prompt system within 5 s, while errors on steps d and h indicated failure to remove the U/ Task card within the 5-s latency.

Failure to pick up the pocket-prompt system or to remove a task card within 5-s was scored as incorrect. This score does not translate directly, however, to a failure to use the prompt system or to a failure to perform the task sequence steps required. For example, a worker could fail to meet the 5-s response latency requirement on any step, but complete the step within 10 s. The actual error rates indicate only failure to respond within 5 s.

Table 5

Error Analysis of Pocket-Prompt System Use

	Treatment	Maintenance	F/-Up	Overall
Percentages of Error Per Condition (All workers)	.0718	.0571	.0973	.0755
Percentages of Steps Gestural Prompts Delivered (All Workers)	.0192	.0100	.0125	.0138
Percentages of Error per Worker and Condition				
W1	.0613	.0420	.0941	.0658
W2	.0950	.0810	.1060	.0940
W3	.0591	.0480	.0920	.0664

Table 6

PERCENTAGES OF ERROR PER STEP OPPORTUNITY BY WORKER

STEP/TASK	W1	(*)	W2	(*)	W3	(*)
a. P/U P/PROMPT	.0507		.1022		.1209	
b. P/U 1ST U/CARD	.0289	(.003)	.0410	(.005)	.0241	
c. U/CARD ON S/CARD	.0181		.0625		.0161	
d. REMOVE U/CARD	.0869	(.025)	.1250	(.045)	.0806	(.032)
e. P/U P/PROMPT	.0833		.1500		.0333	
f. SELECT 2ND U/CARD	.0666		.1000		.0666	(.016)
g. U/CARD ON S/CARD	.0333		.0113		.0333	
h. REMOVE U/CARD	.1666	(.060)	.1333	(.045)	.1500	(.033)

Percentage of Error = the percentage of pocket-prompt steps not completed within the required 5-s response latency

(*) Percentage of steps NOT completed within 10 s (for which gestural prompts were delivered)

STEP/TASK	W1	(*)	W2	(*)	W3	(*)
a. P/U P/PROMPT	.0507		.1022		.1209	
b. P/U 1ST U/CARD	.0289	(.003)	.0410	(.005)	.0241	
c. U/CARD ON S/CARD	.0181		.0625		.0161	
d. REMOVE U/CARD	.0869	(.025)	.1250	(.045)	.0806	(.032)
e. P/U P/PROMPT	.0833		.1500		.0333	
f. SELECT 2ND U/CARD	.0666		.1000		.0666	(.016)
g. U/CARD ON S/CARD	.0333		.0113		.0333	
h. REMOVE U/CARD	.1666	(.060)	.1333	(.045)	.1500	(.033)

Percentage of Error = the percentage of pocket-prompt steps not completed within the required 5-s response latency

(*) Percentage of steps NOT completed within 10 s (for which gestural prompts were delivered)

P/U - Pick Up

P/PROMPT - Pocket Prompt

U/CARD - Unscheduled Task Card

S/CARD - Scheduled Task Card

In the column headed (*) are reported the percentages of steps not completed within 10 s, for which gestural prompts were deliverd. Gestural prompts (e.g., pointing to a task card) were delivered after 10 s had elapsed without an appropriate response. As can be seen in Table 6, no worker failed to pick up the prompt system within 10 s. (step a) indicating that the workers did not actually fail to pick up the pocket-prompt, but that they took longer than 5 s to do so. Likewise, for steps d and h (removal of Unscheduled-Task cards), the percentages of steps not completed within 10 s (for which gestural prompts were delivered) were extremely low, when compared to the overall percentages of error for those steps, i.e., those steps not completed within 5 s.

In the column headed Follow-up, three of the percentages were above .10. There were only five sessions during Follow-up, and, therefore, only 20 opportunities for a worker to perform each step. Each error was divided by 20, so one task-step error would equal .0500. Extended opportunities to perform pocket-prompt steps would likely show a decrease in those error rates.

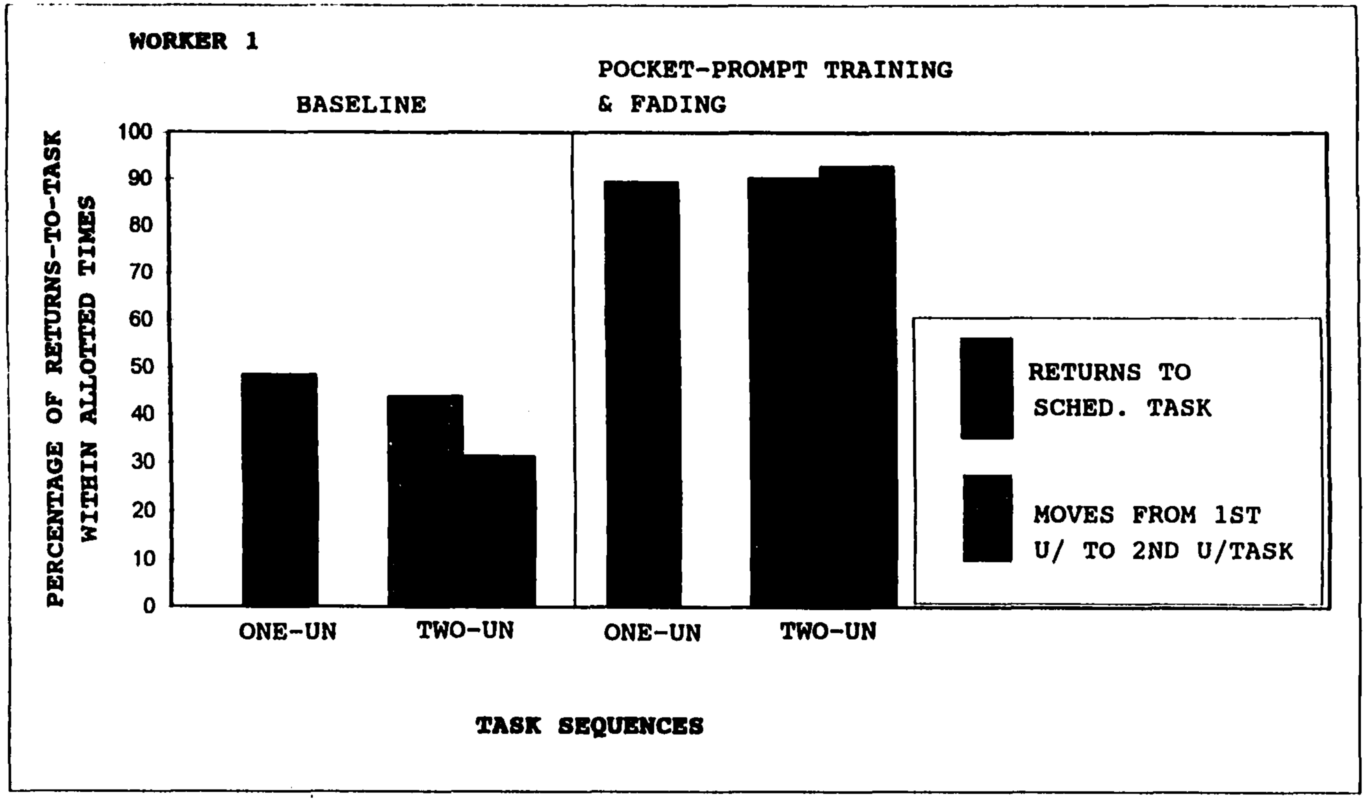
In Row W 2 (Worker 2), another pattern of three percentages greater than .10 is reported. This worker moved more slowly than the others, and since the percentage of pocket-prompt steps that required gestural prompting was only about .05 in 176 step opportunities and .045 in 60 opportunities, Worker 2 did complete pocket-prompt system steps, but he did so within a 10-s latency.

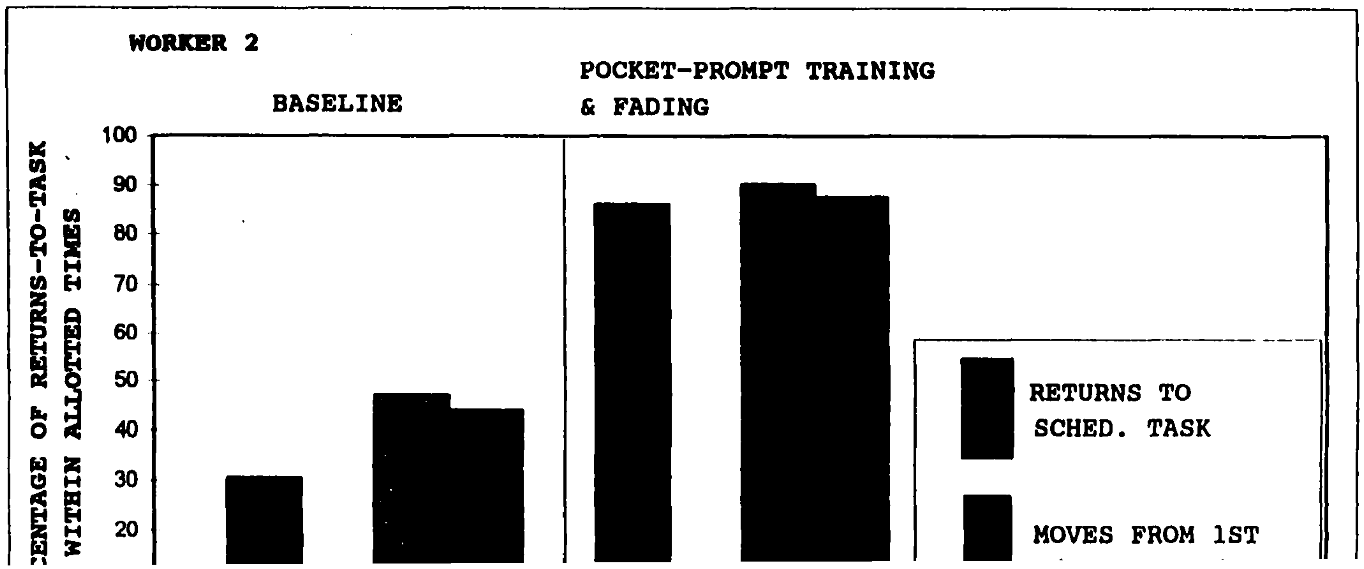
Illustrated in Figure 3 are the results of a comparison of overall percentages of Returns-to-Scheduled Task within allotted times between baseline and Pocket-Prompt Training & Fading for all workers. During baseline, the workers' overall percentage of Returns-to-Scheduled Tasks within allotted times for One-Unscheduled Task Sequences was 38.10%, as compared to 87.30% during Pocket-Prompt Training & Fading, a percentage increase of 49.20%. Individual percentages for workers 1, 2, and 3 during baseline were 48.20%, 30.40%, and 35.70%, respectively, as compared to 89.20%, 86.00%, and 86.70%, respectively, during Pocket-Prompt Training & Fading.

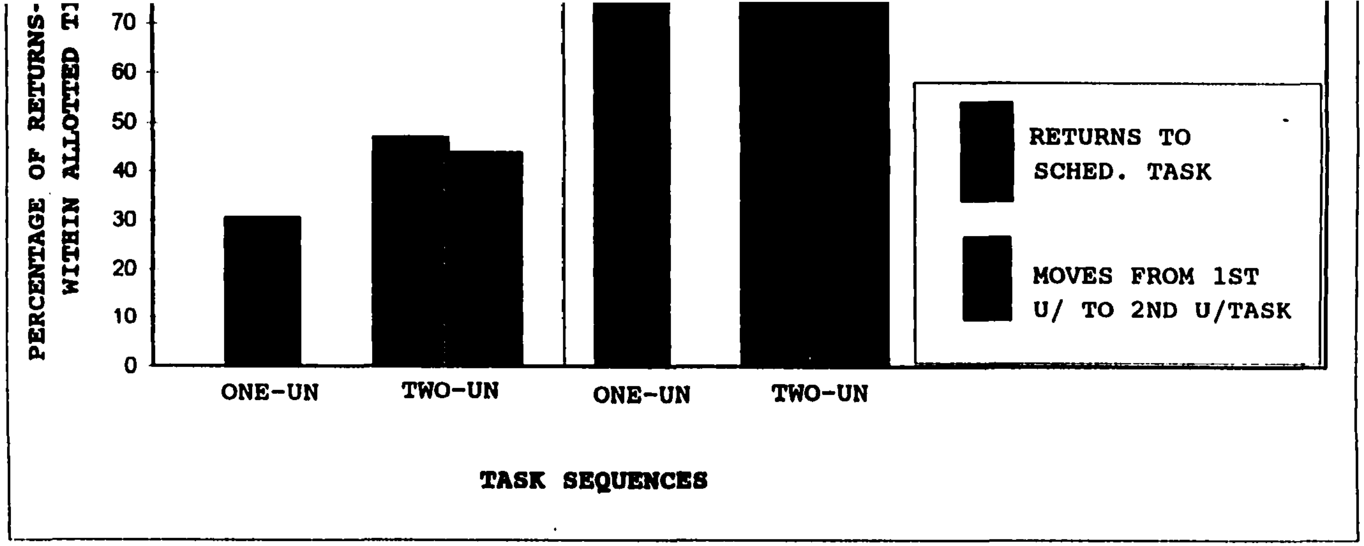
A comparison between baseline and Pocket-Prompt Training & Fading of the workers' overall percentage of Returns-to-Scheduled Tasks within allotted times for Two-Unscheduled Task Sequences is also reported in Figure 3. During baseline, the overall percentage of workers' Returns-to-Scheduled Tasks within allotted times for Two-Unscheduled Task Sequences was 38.60%. During Pocket-Prompt Training & Fading, the workers' overall percentage of Returns-to-Scheduled Tasks within allotted times was 91.66%, an increase of 53.10%. Individual percentages for workers 1, 2, and 3 during baseline were 31.30%, 43.80%, and 40.60%, respectively, compared to 92.50%, 87.50%, and 95.00%, respectively, during Pocket-Prompt Training & Fading.

Also illustrated in Figure 3 is a comparison between baseline and Pocket-Prompt Training & Fading of the workers' overall percentages of MOVES from the 1st to the 2nd Unscheduled Task within allotted times in Two-Unscheduled Task Sequences. The overall percentages were 44.83% during baseline, compared to 90.83% during Pocket-Prompt Training & Fading, an increase of 46.00%. Individual percentages for workers 1, 2, and 3 during baseline were 43.80%, 46.90%, and 43.80%, respectively, compared to 90.00%, 90.00%, and 92.50%, respectively, during Pocket-Prompt Training & Fading.

Figure 3. A comparison of overall percentages of Returns-to-Scheduled Tasks within allotted times by workers for both One-Unscheduled (One-Un) and Two-Unscheduled (Two-Un) Task Sequences, between baseline and Pocket-Prompt Training & Fading conditions is reported. The workers' overall percentage of moves between the 1st (1st U/Task) and 2nd Unscheduled task (2nd U/Task) within allotted times is also reported. This measure represents the percentage of times each worker returned the tools used for the 1st U/Task and arrivied at the 2nd U/Task within the allotted time.


WORKER 1
BASELINE
POCKET-PROMPT TRAINING & FADING
PERCENTAGE OF RETURNS-TO-TASK WITHIN ALLOTTED TIMES
100
90
80
70
60
50
40
30
20
10
0
ONE-UN
TWO-UN
ONE-UN
TWO-UN
RETURNS TO SCHED. TASK
MOVES FROM 1ST U/ TO 2ND U/TASK
TASK SEQUENCES


WORKER 2
BASELINE
POCKET-PROMPT TRAINING & FADING
CENTAGE OF RETURNS-TO-TASK WITHIN ALLOTTED TIMES
100
90
80
70
60
50
40
30
20
RETURNS TO SCHED. TASK
MOVES FROM 1ST


PERCENTAGE OF RETURNS-
WITHIN ALLOTTED TI
70
60
50
40
30
20
10
0
RETURNS TO
SCHED. TASK
MOVES FROM 1ST
U/ TO 2ND U/TASK
ONE-UN
TWO-UN
ONE-UN
TWO-UN
TASK SEQUENCES

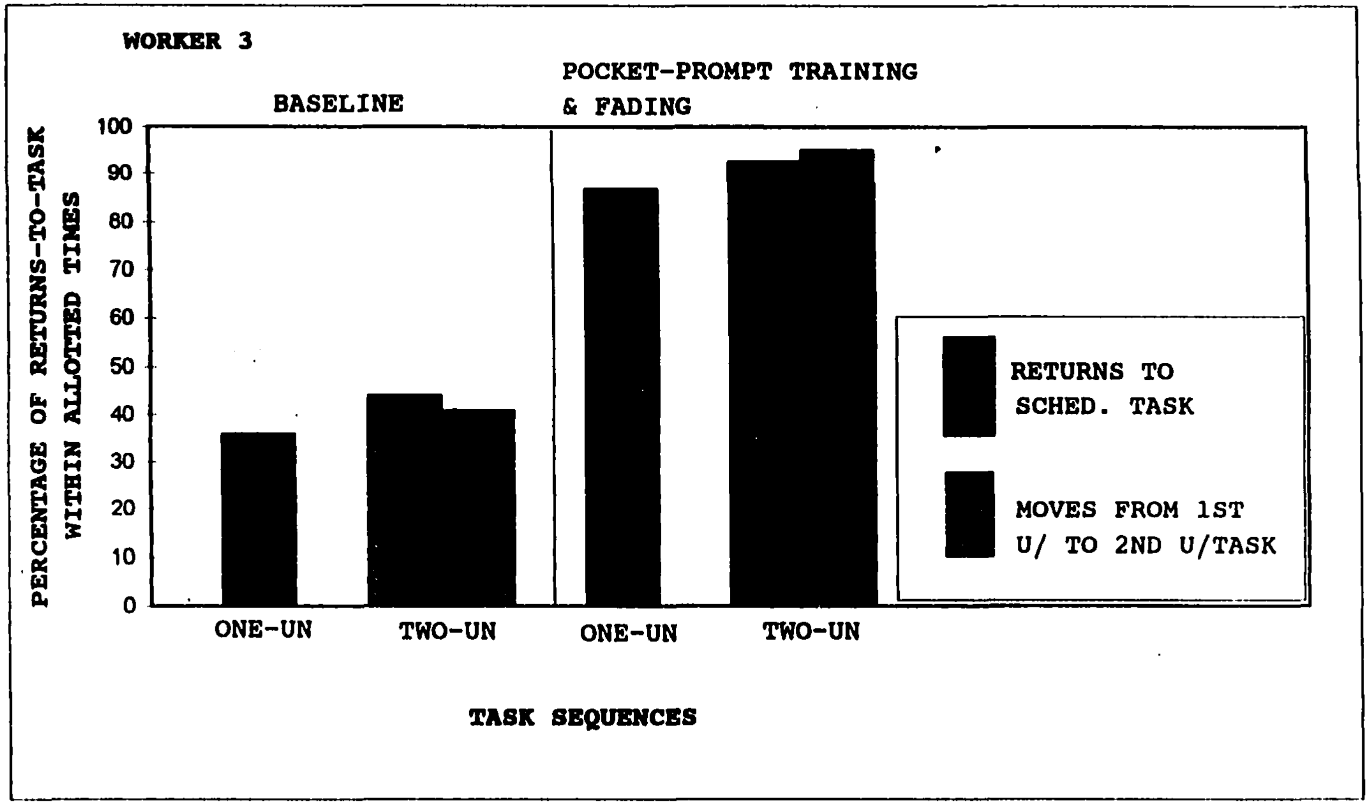

WORKER 3
BASELINE
POCKET-PROMPT TRAINING
& FADING
PERCENTAGE OF RETURNS-TO-TASK
WITHIN ALLOTTED TIMES
100
90
80
70
60
50
40
30
20
10
0
RETURNS TO
SCHED. TASK
MOVES FROM 1ST
U/ TO 2ND U/TASK
ONE-UN
TWO-UN
ONE-UN
TWO-UN
TASK SEQUENCES

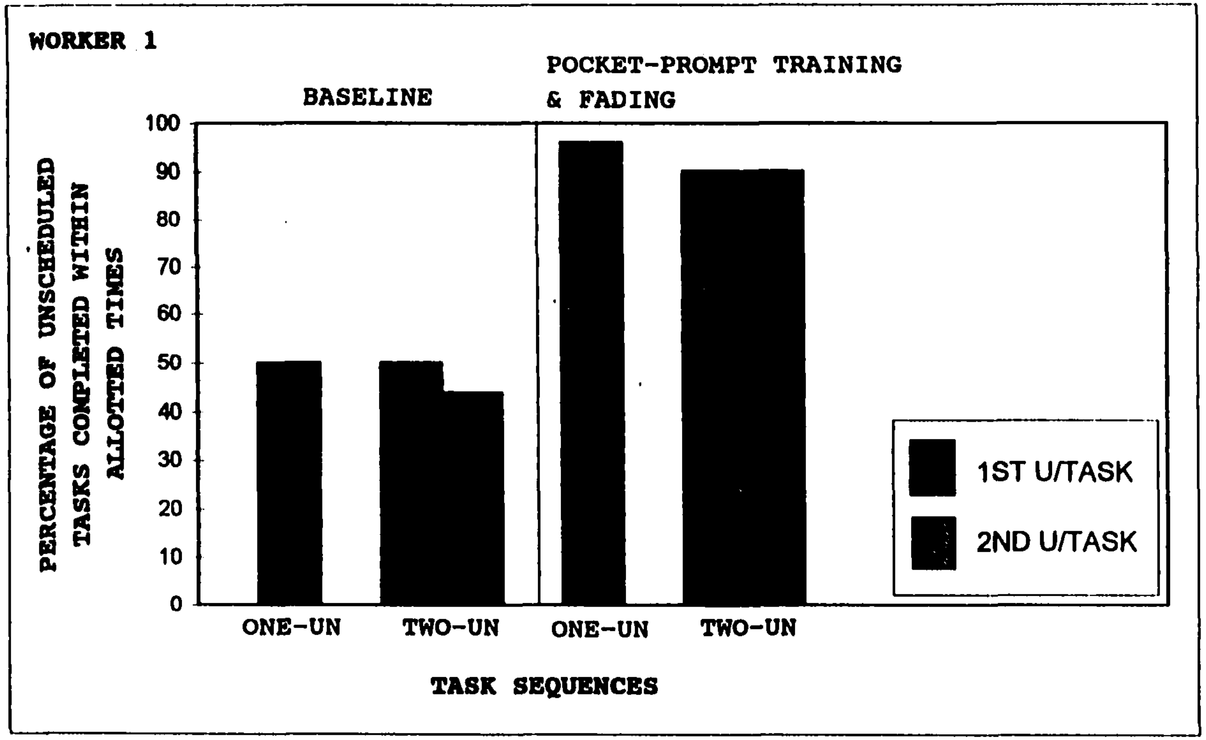
Fig. 3

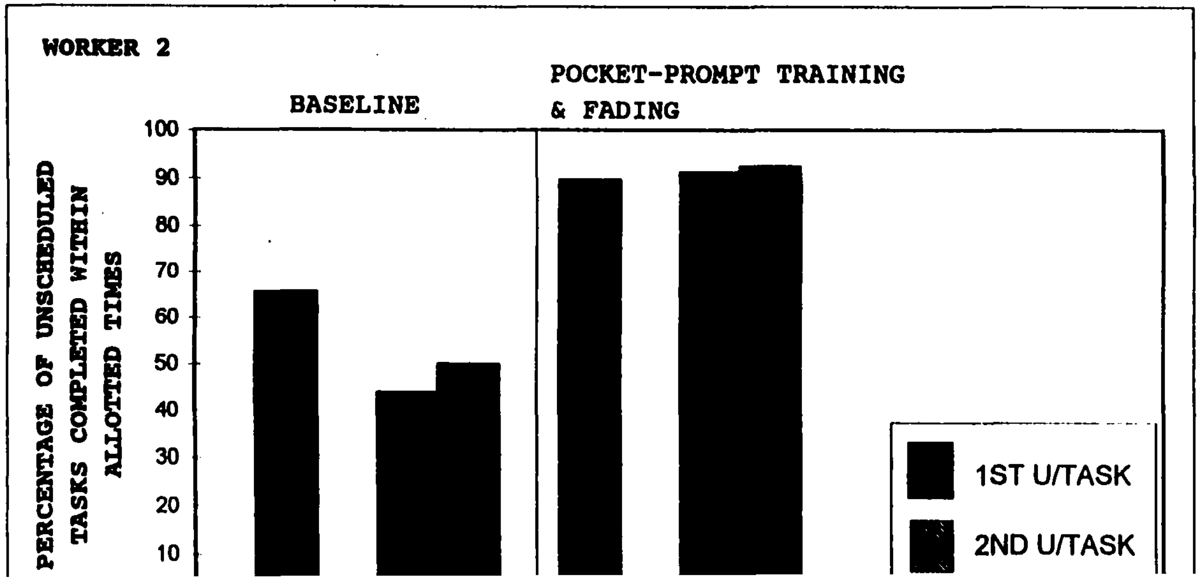
In Figure 4, are illustrated the results of a comparison of the overall percentage of Unscheduled Tasks completed within allotted times between baseline and Pocket-Prompt Training & Fading conditions. For One-Unscheduled Task Sequences. the overall percentage of unscheduled tasks completed within allotted times was 55.96% during baseline, compared to 91.56% during Pocket-Prompt Training & Fading, an increase of 35.60%. The individual percentages of Unscheduled Tasks completed for workers 1, 2, and 3 were 50.00%, 65.40%, and 52.50%, respectively, during baseline, compared to 95.80%, 89.60%, and 89.30%, respectively, during Pocket-Prompt Training & Fading.

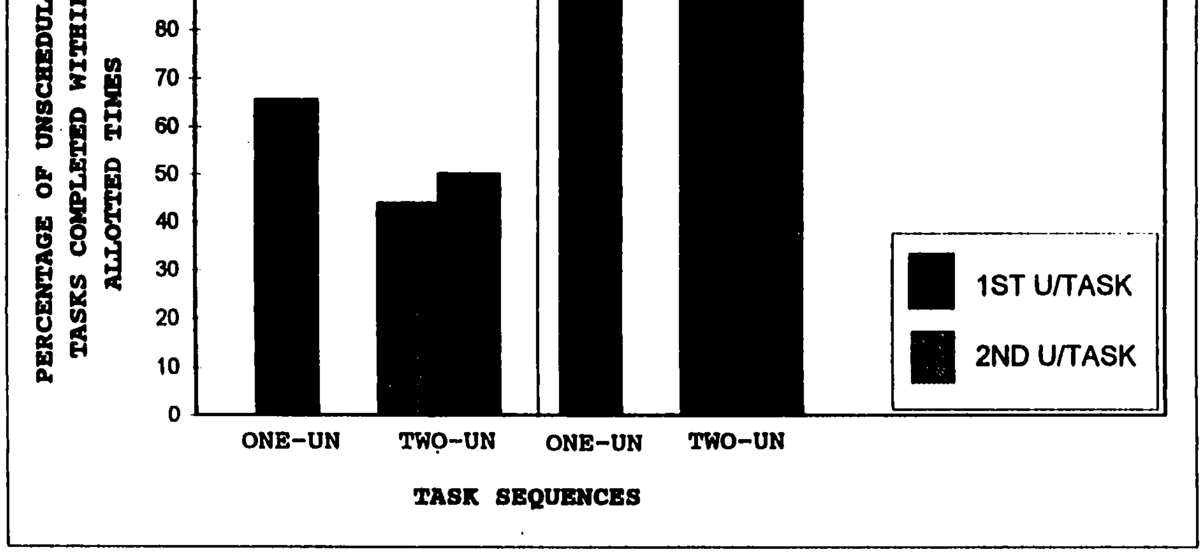
For Two-Unscheduled Task Sequences, the overall percentage of 1st Unscheduled Tasks completed within allotted times during baseline was 44.40%, compared to 90.76% during Pocket-Prompt Training & Fading, an increase of 46.36%. The individual percentages of 1st Unscheduled Tasks completed for Workers 1, 2, and 3 were 43.80%, 50.00%, and 39.40%, respectively, during baseline, compared to 90.00%, 92.30%, and 90.00%, during treatment.

The overall percentage of 2nd Unscheduled Tasks completed within allotted times was 44.13% during baseline, compared to 90.36% during Pocket-Prompt Training & Fading, an increase of 46.23%. The individual percentages of 2nd Unscheduled Tasks completed for workers 1, 2, and 3 were 50.00%, 43.80%, and 38.60%, respectively, during baseline, compared to 90.00%, 91.10%, and 90.00%, during treatment.

Figure 4. A comparison between baseline and Pocket-Prompt Training & Fading conditions of overall percentages of Unscheduled Tasks completed within allotted times for One-Unscheduled Task Sequences (One-Un) and Two-Unscheduled Task Sequences (Two-Un).


WORKER 1
BASELINE
POCKET-PROMPT TRAINING & FADING
PERCENTAGE OF UNSCHEDULED TASKS COMPLETED WITHIN ALLOTTED TIMES
100
90
80
70
60
50
40
30
20
10
0
ONE-UN
TWO-UN
ONE-UN
TWO-UN
TASK SEQUENCES
1ST U/TASK
2ND U/TASK


WORKER 2
BASELINE
POCKET-PROMPT TRAINING & FADING
PERCENTAGE OF UNSCHEDULED TASKS COMPLETED WITHIN ALLOTTED TIMES
100
90
80
70
60
50
40
30
20
10
1ST U/TASK
2ND U/TASK


PERCENTAGE OF UNSCHEDULED TASKS COMPLETED WITHIN ALLOTTED TIMES
80
70
60
50
40
30
20
10
0
1ST U/TASK
2ND U/TASK
ONE-UN
TWO-UN
ONE-UN
TWO-UN
TASK SEQUENCES

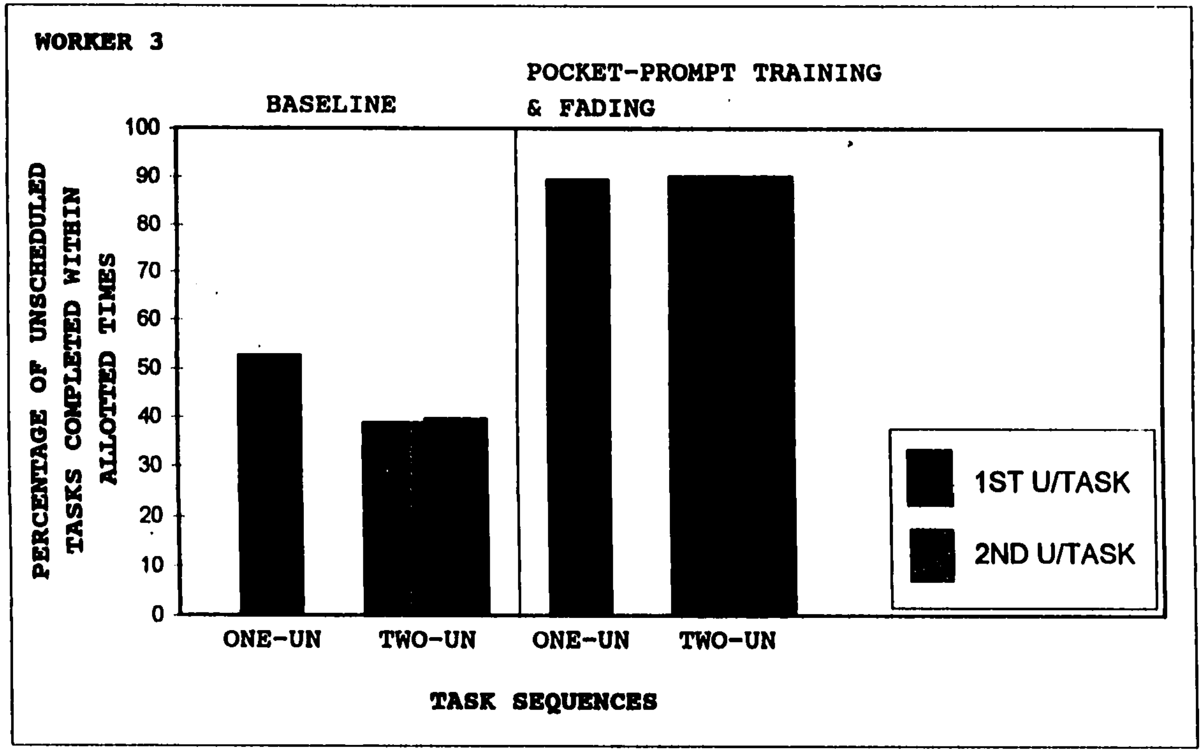

WORKER 3
BASELINE
POCKET-PROMPT TRAINING & FADING
100
90
80
70
60
50
40
30
20
10
0
PERCENTAGE OF UNSCHEDULED TASKS COMPLETED WITHIN ALLOTTED TIMES
1ST U/TASK
2ND U/TASK
ONE-UN
TWO-UN
ONE-UN
TWO-UN
TASK SEQUENCES

Fig. 4

Discussion

The systematic increase in the percentage of task-sequence steps completed by each worker in the present study with the introduction of graduated guidance and the pocket-prompt system, and sustained through task-card fading (size and color), leads one to conclude that pocket-prompt system was responsible for acquisition. During baseline, none of the workers completed task-sequence steps within allotted times with more than 54% accuracy. When the pocket-prompt system was introduced, however, each worker's percentage of task-sequence steps completed for both One- and Two- Unscheduled Task Sequences increased dramatically.

Probes were used throughout the study. During baseline, One-Unscheduled Task probes were obtained with Unscheduled Task cards that would not be used in training. Two-Unscheduled Task probes during baseline measured each worker's completion of task-sequence steps for two consecutive Unscheduled Tasks. In addition, 20 probes were used to measure each worker's completion of task-sequence steps for two consecutive Unscheduled Tasks with Unscheduled Task cards that would not be used in training. These probes were used twice during Pocket-Prompt Training & Fading.

Follow-up measures, obtained one month after the completion of the study, showed that each of the workers continued to complete more than 90.00% of all task-sequence steps within allotted times over five consecutive sessions. Response acquisition, maintenance, and generalization were, therefore, demonstrated in this study.

The results of comparisons made between baseline and treatment of each worker's Returns-to-Scheduled Tasks indicated that when each worker used the pocket-prompt system, his percentage of Returns-to-Scheduled Task within allotted times increased dramatically (Figure 3). A comparison between baseline and treatment shows that the percentage of Unscheduled Tasks completed within allotted times by each worker increased for both One- and Two- Unscheduled Task Sequences increased with training. (Figure 4)

The results of the present study demonstrated clearly that workers with developmental disabilities can be trained to respond appropriately to multiple, unscheduled task demands in a work setting. Before this study began, each worker had demonstrated competence at each of the work tasks required. None of the workers, however, had collected tools for unscheduled tasks, completed those unscheduled tasks and returned to scheduled tasks in the absence of verbal prompts from staff. The maintenance workers in this investigation were trained to make appropriate and timely responses to multiple, unexpected task demands in a work setting by using a self-management, pocket-prompt system.

Picture prompts have been used to promote independence in vocational training programs for persons with developmental disabilities. Vocational training programs have included these prompts in multicomponent self-management treatment packages (Agran et al. 1989; Connis, 1979; Sowers, Rusch, Connis, and Cummings, 1980; Sowers, Verdi, Bourbeau, and Sheehan, (1985); Wacker & Berg, 1983; and, Wacker, Berg, Berrie, and Swatta, 1985).

A comparison of this study to other studies that used picture prompts, or picture-activity schedules, indicates that, while some similarities exist between this study and past picture-cue studies in vocational training, differences also exist between the present study and those conducted in the past. The present study is similar to three picture-prompt studies

(Connis, 1979; Sowers, et al. 1980; Sowers, et al. 1985), in that picture prompts were used to promote independent task change in vocational settings. One of the three studies used conditional discrimination as a task requirement (Sowers et. al. 1980). The present study is similar in procedure to a study conducted by MacDuff et al. (1993). In both the present study and the MacDuff et al. (1993) study, picture cues and graduated guidance were used in training.

The differences between the present investigation and prior picture-prompt studies, or studies that used picture activity schedules, are structual, as well as practical. First, the present study was conducted in a work setting, where the participants were full-time employees, while previous picture-prompt training studies were conducted in vocational training programs.

Second, the stimulus arrangement in this study differs vastly from arrangements used in all other picture-prompt and picture-activity schedule studies. In all of those studies, the presentation of picture prompts was sequential, and the stimulus arrangement was stationary, presented as sequential pictures on a wall, or as consecutive pages in a book. In the present study, however, the picture-prompt system itself was portable, i.e., it could be carried in a worker's pocket throughout the entire work day. And, the picture prompts in this investigation were presented simultaneously, with each task card connected to a string that hung from a binder ring. Thus, in the present study, the workers had access to the discriminative stimuli at all times to prompt them to make the correct responses to multiple demands.

Third, the task requirement in the present study was conditional discrimination (Catania, 1992). For example, a worker's appropriate selection and use of an Unscheduled Task card on the prompt system was conditional upon the specific task instructions delivered (the specific unscheduled task to be done). Only one other picture-prompt study (Sowers et al. 1980) used conditional discrimination training. All of the other picture-prompt studies used in vocational settings used simple discrimination training. The importance of conditional discrimination learning cannot be overemphasized. Simple discrimination tasks can be encompassed within the three-term contingency (S-R-Sr). When one learns a simple discrimination task, what is learned is that, in the presence of a discriminative stimulus, one response is appropriate, and one consequence follows (e.g., one link on a behavior chain). Conditional discrimination tasks require stimulus-specific responses. Stimulus control over responding is acquired by establishing or training relationships between each sample stimulus (Sa) and its appropriate, or positive, comparison stimulus (Co+). When a sample stimulus is presented, the learner must select from among one positive comparison (Co+) and one or more negative comparisions (Co-). A demonstration that the transfer of stimulus control from trainer to learner has occurred is the learner's reliable demonstrated ability to select the positive comparison in the presence of a sample stimulus (Catania, 1992).

Fourth, the contents of learning in this study was unique. What was learned by these workers was: (a) stimulus-specific responses to a selection of picture prompts, each response conditional on specific task demands (instructions to perform one unscheduled task U1, U2, U3, or U4; or any combination of those tasks); and, (b) two novel and complex chains of responses, each of which is conditional on specific task demands (instructions to perform one unscheduled task or two unscheduled tasks). Each response chain has a particular set of stimulus-response links, (pocket-prompt steps a through d); or (pocket-prompt steps a through h). Each of these response chains serves as a connector for other distinct and complex chains of motor responses, each with specific sets of stimulus-response links, (task-sequence steps 1 through 7); or (task-sequence steps 1 through 11). The product of training, therefore, was the acquisition of two novel response chains (each pocket-prompt step sequence), each of which can be used conditionally with another chain of responses, a One-Unscheduled Task sequence, or or with a Two-Unscheduled Task sequences, depending on the task instructions delivered.

The increase in the workers' self-management of unscheduled task demands, translates to increased competence, which makes them more attractive candidates for competitive employment outside the agency. In addition, the acquired skill will enable them to select from among a variety of job opportunities, which could, very likely be accompanied by higher salaries and an increase in independence (Rusch & Hughes, 1989).

According to Rusch, Martin and White, (1985), workers have many times failed to maintain productive work behavior due to heavy reliance on verbal prompts. One of the most important results of the present study is the reduction of prompt dependence by these workers. To function effectively in work settings, generalized responding is required (Rusch and Hughes, 1989). Although it has been suggested that picture-prompt training may have a direct effect on response generalization in vocational settings, only two studies (Wacker and Berg, 1983; Wacker et al. 1985) provided empirical evidence of direct correspondence between picture-prompt training and generalization. As a procedural component of the present study, explicit strategies were used to insure the promotion of generaiization according to the recommendations Stokes and Baer, (1977).

The workers in this study acquired a skill that had not been demonstrated before training. They were trained to use the pocke-prompt system to monitor their completion of task-sequence steps. The workers were trained to complete One-Unscheduled Task Sequences with two Scheduled Task cards (S1 and S2) and two training Unscheduled Task cards (U1 and U2). The workers completed task-sequence steps to criterion when novel tasks were required (Unscheduled Task cards U3 and U4). In addition, although they were trained to complete One-Unscheduled Task Sequences, the workers used the pocket-prompt system and completed to criterion all steps in Two-Unscheduled Task Sequences. At the very least, this skill will help these workers to retain their present job positions (Rusch & Hughes, 1989; Rusch, Martin, & White, 1985; Wacker & Berg, 1983). At the most, this skill will provide these and other maintenance workers with basic competency that could facilitate entrance into other areas of competetive employment, should they so choose.

The findings of the present investigation might very well have far-reaching implications in the field of developmental disabilities. For example, these findings could have a significant impact on the structure of programs designed to train vocational skills to persons with developmental disabilities in the future. Of particular significance is the finding that an effective and simple tool has been developed, through which persons with developmental disabilities can be trained to respond to multiple, unscheduled task demands. The pocket-prompt system designed for this investigation is portable, versatile, consumer-friendly, and unobtrusive (cards can be slipped easily into one's pocket). What is most significant in these findings is that use of the pocket-prompt system to increase independent functioning may provide many persons with developmental disabiliities with the necessary skills to facilitate movement along the continuum of services available in this field, such as supported or competetive employment, and supported apartment living.

The present study is unique, in that the procedure used to train the workers to use the pocket-prompt system was graduated guidance. Of the studies that used picture cues in the past, only MacDuff et al. 1993 designed a treatment procedure with only two components (graduated guidance and photographic activity schedules) to train young men with autism to manage leisure activities independently. The use of graduated guidance in training eliminates the need to fade verbal prompts, which are nearly impossible to fade (MacDuff et al. 1993).

The present study is similar to the MacDuff et al. (1993) study in that both studies used graduated guidance and pictures as prompts in two-component treatment packages. In both studies, independent response chains were trained that were unique. The young men in the MacDuff et al. study were trained to turn the pages of a photographic activity schedule and to return to the schedule after completing an activity. The workers in the present study were trained to use scheduled and unscheduled task cards on a pocket-prompt system to monitor particular multiple task demands. Each resulting behavior chain was used to self-manage a variety of other response chains, each of which encompasses a task, or an activity. The present study differs from the MacDuff et al. (1993) in setting; population; task requirements; type of stimuli used; stimulus arrangement; and, learning content.

The results of the present investigation suggest that the pocket-prompt system had a direct and powerful effect on acquisition, because the acquired response maintained by each worker at a high rate, even though physical prompting was faded within ten or fewer sessions. Because the effects of graduated guidance cannot be isolated, however, it cannot be totally ignored as a contributory treatment component. In the absence of component isolation, conclusive evidence that the pocket-prompt system alone accounts for the dramatic increase in the target behavior cannot be reported at this time. MacDuff et al. (1993), however, did find similar results using a two-component treatment package. At the very least, the picture prompts had a contributory influence over the acquired response in this study. The increase in the target responses across all subjects, all stimuli, and all responses found in this study, is the result of the effective transfer of stimulus control over the target responses from other-managed verbal prompts to a self-managed pocket-prompt system.

It is recommended that future pocket-prompt studies make an effort to identify the stimuli that exert the most control over behavior when designing multicomponent treatment "packages". They could either reduce the number of components used in training (MacDuff et al. 1993), or they could plan studies that will permit component analyses (Martin et al. 1982) of their training programs.

Alternative self-management strategies may be combined systematically with the pocket-prompt system used in the present study. For example, verbal instructions alone could be used to train use of the pocket-prompt system. Results identical to those found in the present investigation would provide further evidence to support the supposition that the picture-prompt system accounts for acquisition.

Consideration must be given to acceptable response latency requirements for completing each pocket-prompt step. For example, in this study, Worker 2 would have made very few errors using the system if the latency requirement was 10 s, rather than 5 s.

An increase in the number of scheduled tasks represented by scheduled task cards is recommended in future studies. Additional studies might also include additional measures of generalization. For example, the procedure used in the present study could be replicated using six unscheduled task cards. Two of these unscheduled task cards could be used for training, while four unscheduled task cards could be used to measure generalization. Generalization measures could include probing learners' completion of steps in sequences that include three, or more, consecutive unscheduled tasks. Additional fading conditions could be used, wherein all scheduled tasks are listed could be listed one task card, while unscheduled tasks could be represented by words, or symbols, that are no larger than a velcro coin dot. Finally, the pocket-prompt system could be useful in other settings, and with a variety of tasks.

Appendix A

Response Times (in seconds) Allotted for Completing Task-Sequence Steps and for Completing Unscheduled Tasks

Letter-Number Codes Assigned to Each Task

S1 - SWEEP (In)	U1 - MOP	U3 - REFILL Dispenser
S2 - EMPTY Garbage	U2 - SWEEP (Out)	U4 - VACUUM

ONE-UNSCHEDULED TASK SEQUENCES:

	S1/U1	S1/U2	S1/U3	S1/U4	S2/U1	S2/U2	S2/U3	S2/U4
STOP	5	5	5	5	5	5	5	5
GET TOOLS	60	15	60	60	60	15	60	60
GO TO U/Task	15	60	60	60	15	60	60	60
DO U/Task	90	90	150	150	90	90	150	150
RETURN TOOLS	30	60	60	60	30	60	60	60
RETURN S/TASK	30	15	15	15	30	15	15	15
RESUME S/TASK	5	5	5	5	5	5	5	5

TWO-UNSCHEDULED TASK SEQUENCES: (each preceded by S1 or S2)

	U1/U2	U2/U1	U1/U3	U1/U4	U2/U3	U2/U4
STOP	5	5	5	5	5	5
GET TOOLS	30	60	60	60	60	60
GO TO 2nd U/T	60	15	60	60	60	60

RETURN S/TASK	30	15	15	15	30	15	15	15
RESUME S/TASK	5	5	5	5	5	5	5	5

<u>TWO-UNSCHEDULED TASK SEQUENCES</u>: (each preceded by S1 or S2)

	U1/U2	U2/U1	U1/U3	U1/U4	U2/U3	U2/U4
STOP	5	5	5	5	5	5
GET TOOLS	30	60	60	60	60	60
GO TO 2nd U/T	60	15	60	60	60	60
DO 2nd U/Task	90	90	150	150	150	150
RETURN TOOLS	60	30	60	60	60	60
RETURN S/TASK	15	30	15	15	15	15
RESUME S/TASK	5	5	5	5	5	5

	U3/U1	U3/U2	U4/U1	U4/U2	U3/U4	U4/U3
STOP	5	5	5	5	5	5
GET TOOLS	60	15	60	30	15	15
GO TO 2nd U/T	15	60	15	60	60	60
DO 2nd U/Task	90	90	90	90	150	150
RETURN TOOLS	30	60	30	60	60	60
RETURN S/TASK	30	15	30	15	15	15
RESUME S/TASK	5	5	5	5	5	5

Appendix B

Onset/Offset Criteria for All Tasks

SCHEDULED (S) TASKS: ONSET/OFFSET:

SWEEP (Inside) (S1) ONSET: Push broom in forward motion on designated sweep area

OFFSET: All debris > .63 cm removed from designated sweep area

EMPTY (Garbage) (S2) Both hands on edges of liner to be removed from pail

OFFSET: Empty pail returned to storage

UNSCHEDULED (U) TASKS:

MOP (U1) ONSET: Mop placed into pail

OFFSET: Entire 91.44 x 152.4 cm floor surface mopped

SWEEP (Outside) (U2) ONSET: Bristles of broom touching cement and being pushed forward

OFFSET: All debris > .63 cm removed from designated sweep area

REFILL Dispensers (U3) ONSET: Cross bathroom threshold

OFFSET: Exit bathroom threshold

VACUUM Office (U4) ONSET: Vacuum placed on floor at office entrance with power switch in on position

OFFSET: Exit office threshold w/vacuum

Appendix C

OBSERVER EXAMINATION

NAME:__________________ DATE:__________________

1. Define response latency? __________________
2. How are task combinations selected each day? __________________
3. What is the offset for Vacuuming? __________________
4. How do you use the stopwatch to measure each step __________________
5. How many seconds are allowed for picking up the P/Prompt? __________
6. What is the offset for Sweeping outside? __________________
7. What is the code for hand-over-hand guidance? ____________
8. What is the response latency for stopping S/Task? __________________
9. What is the offset for refilling dispensers? ________________
10. Where is Sweeping outside done when it is raining? ________________
11. What are the codes for fading proximity? __________________
12. What is the onset for sweeping outside?__________________
13. What are the consequences during baseline ? __________________
14. Name 3 of the target sites __________________
15. How many cycles make up one session? __________________
16. If a worker fails to respond accurately during color fading, what are the consequences? __________________
17. What are the unscheduled tasks used for training?

9. What is the offset for refilling dispensers? ________

10. Where is Sweeping outside done when it is raining? ________

11. What are the codes for fading proximity? ________

12. What is the onset for sweeping outside? ________

13. What are the consequences during baseline ? ________

14. Name 3 of the target sites ________

15. How many cycles make up one session? ________

16. If a worker fails to respond accurately during color fading, what are the consequences? ________

17. What are the unscheduled tasks used for training? ________

18. Name the scheduled tasks? ________

19. What is the onset for Mopping? ________

20. What are the consequences for not completing 4 cycles at 100% during Pocket-Prompt Training? ________

21. What is the offset for Sweeping outside? ________

22. How many steps are there in one cycle during baseline? ________

23. What is the allotted time for resuming work on Scheduled tasks ? ________

24. What tasks are used to measure stimulus generalization ? ________

25. How many steps to use the pocket-prompt system:

   a. for a one-unscheduled task sequence? ________

   b. for a two-unscheduled task sequence? ________

Appendix D1

DATE: _____ WORKER:______ E/O MP/ KG/ HV CONDITION:________DIRECTIONS:

For Each CYCLE ENTER: ORDER of Tasks (e.g. S1/U2, S2/U3)

S1 SWEEP INSIDE U1 MOP SPILL U3 REFILL DISPENSER

S2 EMPTY GARBAGE U2 SWEEP OUTSIDE U4 VACUUM OFFICE

For Each NUMBERED Step: ENTER RESPONSE LATENCY (in seconds)

For Each LETTERED Step: CIRCLE YES if W/ 5 s or NO; and

CIRCLE PROMPT LEVEL (if any)

TASK COMBINATION ORDER:__________________

1. STOP S/TASK (5s) ________

   a. Pick up Prompt YES NO Hand Wrist Elbow Shlder 1 2 3 4

   b. U/Card 1st YES NO Hand Wrist Elbow Shlder 1 2 3 4

   c. U/Card on S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

2. GET TOOLS (15/30/60 s) ________

3. GO TO U/Site (15/30/60 s) ________

4. DO U/TASK (90/150 s) ________

5. RETURN TOOLS (15/30/60 s) ________

   d. U/Card from S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

For Each NUMBERED Step: ENTER RESPONSE LATENCY (in seconds)

For Each LETTERED Step: CIRCLE YES if W/ 5 s or NO; and

CIRCLE PROMPT LEVEL (if any)

TASK COMBINATION ORDER: ____________________

1. STOP S/TASK (5s) ________

   a. Pick up Prompt YES NO Hand Wrist Elbow Shlder 1 2 3 4

   b. U/Card 1st YES NO Hand Wrist Elbow Shlder 1 2 3 4

   c. U/Card on S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

2. GET TOOLS (15/30/60 s) ________

3. GO TO U/Site (15/30/60 s) ________

4. DO U/TASK (90/150 s) ________

5. RETURN TOOLS (15/30/60 s) ________

   d. U/Card from S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

6. RETURN TO S/TASK (15/30/60 s) ________

7. RESUME S/TASK (5s) ________

TOTAL NUMBERED STEPS CORRECT ____/____ = ____%

TOTAL LETTERED STEPS CORRECT ____/____ = ____%

Appendix D2

DATE: _____ WORKER: _______ E/O MP/ KG/ HV CONDITION: _________ DIRECTIONS:

For Each CYCLE ENTER: ORDER of Tasks (e.g. S1/U2, S2/U1, S1/U1/U2)

S1	SWEEP INSIDE	U1	MOP SPILL	U3	REFILL DISPENSER
S2	EMPTY GARBAGE	U2	SWEEP OUTSIDE	U4	VACUUM OFFICE

For Each NUMBERED Step: ENTER RESPONSE LATENCY (in seconds)

For Each LETTERED Step: CIRCLE YES if W/ 5 s or NO; and CIRCLE PROMPT LEVEL (if any)

TASK COMBINATION ORDER: ____________________

1. STOP S/TASK (5s) _______
   a. Pick up Prompt YES NO Hand Wrist Elbow Shlder 1 2 3 4
   b. Select 1st U/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4
   c. 1st U/T Card on S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4
2. GET TOOLS (15/30/60 s) _______
3. GO TO U/Site (15/30/60 s) _______
4. DO U/TASK (90/150 s) _______

NOTE: W/10s of W's engagement in 1st U/Task (STEP 4), instructions delivered to do another Unscheduled Task. Workers must:

b. Select 1st U/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

c. 1st U/T Card on S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

2. GET TOOLS (15/30/60 s) ________

3. GO TO U/Site (15/30/60 s) ________

4. DO U/TASK (90/150 s) ________

NOTE: W/10s of W's engagement in 1st U/Task (STEP 4), instructions delivered to do another Unscheduled Task. Workers must:

d. Pick up Prompt YES NO Hand Wirst Elbow Shlder 1 2 3 4

e. Select 2nd U/T Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

f. 2nd U/T Card on S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

5. RETURN TOOLS (15/30/60 s) ________

g. 1st U/T Card from S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

6. GET TOOLS (15/30/60 s) ________

7. GO TO 2nd U/Site (15/30/60/ s) ________

8. DO 2nd U/TASK (90/150 s) ________

9. RETURN TOOLS (15/30/60 s) ________

h. 2nd U/T Card from S/Card YES NO Hand Wrist Elbow Shlder 1 2 3 4

10. RETURN TO S/TASK (15/30/60 s) ________

11. RESUME S/TASK (5s) ________

TOTAL NUMBERED STEPS CORRECT ____/____=____%

TOTAL LETTERED STEPS CORRECT ____/____=____%

Appendix E

One- and Two-Unscheduled Task Sequence Task Combinations

Scheduled Tasks:		Unscheduled Tasks:			
SWEEP (In)	(S1)	Mop Spill	(U1)	REFILL Dispenser	(U3)
EMPTY Garbage	(S2)	Sweep (Out)	(U2)	VACUUM Office	(U4)

One-Unscheduled Task Training Sequences:

S1/U1	Sweep I/Mop Spill	S2/U1	Empty Garbage/Mop Spill
S1/U2	Sweep I/Sweep O	S2/U2	Empty Garbage/Sweep O

One-Unscheduled Task Sequence Probes:

S1/U3	Sweep I/Refill	S2/U3	Empty /Refill
S1/U4	Sweep/Vacuum	S2/U4	Empty /Vacuum

Two-Unscheduled Task Sequence Probes:

S1/U1/U2	Sweep I/Mop/Sweep O	S2/U1/U2	Empty/Mop/Sweep O
S1/U2/U1	Sweep I/Sweep O/Mop	S2/U2/U1	Empty/Sweep O/Mop

One-Unscheduled Task Sequence Probes:

S1/U3	Sweep I/Refill	S2/U3	Empty /Refill
S1/U4	Sweep/Vacuum	S2/U4	Empty /Vacuum

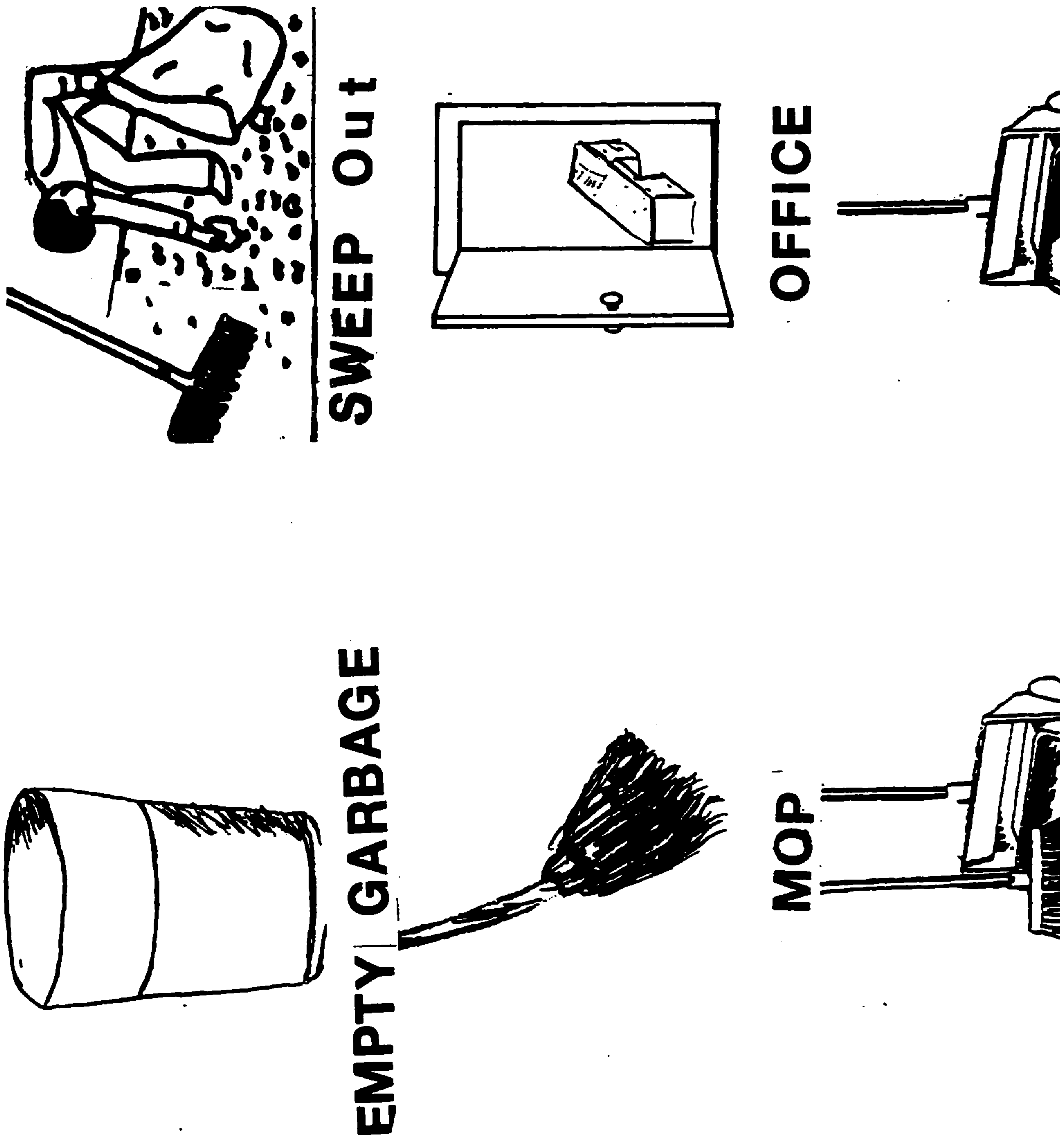
Two-Unscheduled Task Sequence Probes:

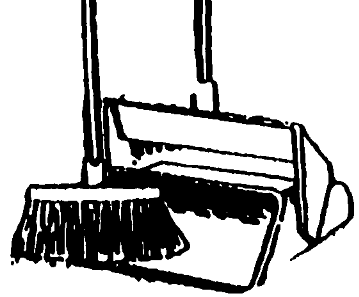
S1/U1/U2	Sweep I/Mop/Sweep O	S2/U1/U2	Empty/Mop/Sweep O
S1/U2/U1	Sweep I/Sweep O/Mop	S2/U2/U1	Empty/Sweep O/Mop

One- and Two-Unscheduled Task Sequence Probes:

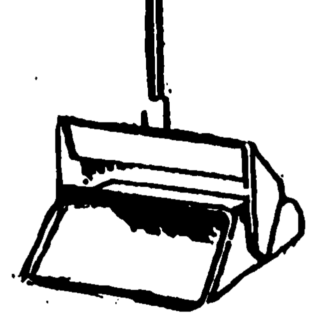
S1/U1/U3	Sweep I/Mop/Refill	S2/U1/U3	Empty/Mop/Refill
S1/U1/U4	Sweep I/Mop/Vacuum	S2/U1/U4	Empty/Mop/Vacuum
S1/U2/U3	Sweep I/Sweep O/Refill	S2/U2/U3	Empty/Sweep O/Refill
S1/U2/U4	Sweep I/Sweep O/Vacuum	S2/U2/U4	Empty/Sweep O/Vacuum
S1/U3/U1	Sweep I/Refill/Mop	S2/U3/U1	Empty/Refill/Mop
S1/U3/U2	Sweep I/Refill/Sweep O	S2/U3/U2	Empty/Refill/Sweep O
S1/U4/U1	Sweep I/Vacuum/Mop	S2/U4/U1	Empty/Vacuum/Mop
S1/U4/U2	Sweep I/Vacuum/Sweep O	S2/U4/U2	Empty/Vacuum/Sweep O
S1/U3/U4	Sweep I/Refill/Vacuum	S2/U3/U4	Empty/Refill/Vacuum
S1/U4/U3	Sweep I/Vacuum/Refill	S2/U4/U3	Empty/Vacuum/Refill

Appendix F

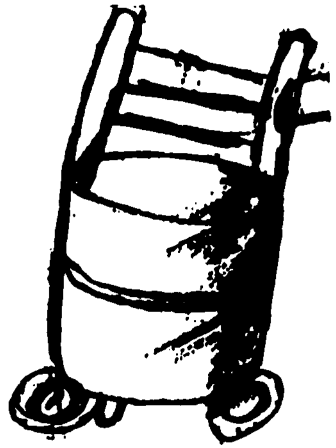




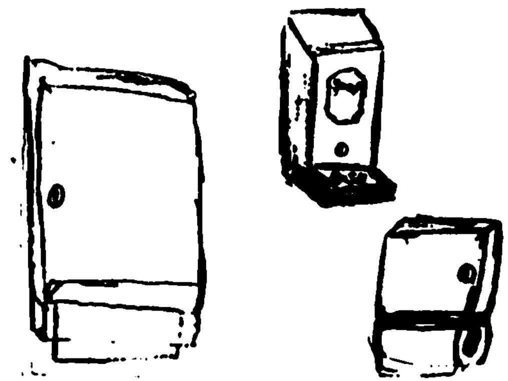
SWEEP In



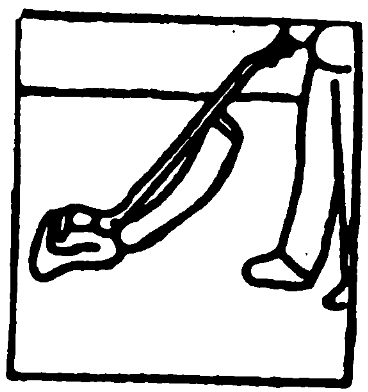
DUSTPAN



PAIL



REFILL Dispensers



VACUUM

BROOM

Appendix G

<u>PRETEST INSTRUCTIONS</u>:

"Let's see if you can recognize some of the pictures and words that describe objects and tools you use during work."

<u>PRETRAINING INSTRUCTIONS</u>:

"These cards (<u>DISPLAY</u> pocket-prompt system) will help you keep track of what jobs you have to do. You can hook the ring onto our belt loop like this" (<u>MODEL</u>). "So, if you are Sweeping, put this black clip onto the large Sweep card so you know what job you are doing, in case your boss calls you away for something. If your boss asks you to Mop, you just pick up the smaller card that says, 'MOP' and stick card onto the larger SWEEP card. Get the mop, do the job, and put back the mop. After you do that, PULL the small MOP card off the larger SWEEP card and go back to the job you were doing (the one with the black clip) See, right now you would go back to SWEEP."

<u>GENERAL INSTRUCTIONS</u> (delivered immediately before 1st Training Sesion)

"Remember! When you are asked to leave the job you are doing and do another job, you must":

1. STOP what you are doing;
2. GET tools to do the other job;
3. GO to the otherjob;

GENERAL INSTRUCTIONS (delivered immediately before 1st Training Sesion)

"Remember! When you are asked to leave the job you are doing and do another job, you must":

1. STOP what you are doing;
2. GET tools to do the other job;
3. GO to the otherjob;
4. DO the other job;
5. RETURN the tools you used;
6. RETURN to your scheduled job; and,
7. RESUME work on your scheduled job.

Do each step as well and as quickly as you can!"

ONE-U/TASK INSTRUCTIONS:

While a worker was engaged in a Scheduled task, instructions were delivered as follows: "Worker's Name, stop what you are doing now and go and do name Unscheduled Task. When you are finished, return the tools you used and return to the job you were doing.

TWO-U/TASK SEQUENCE INSTRUCTIONS: Within 10 s of the worker's engagement in the 1st U/Task, say, " when you finish name 1st U/task and put the tools back, do name of 2nd U/Task. After you do that job and put the tools back go back to the job you were doing before."

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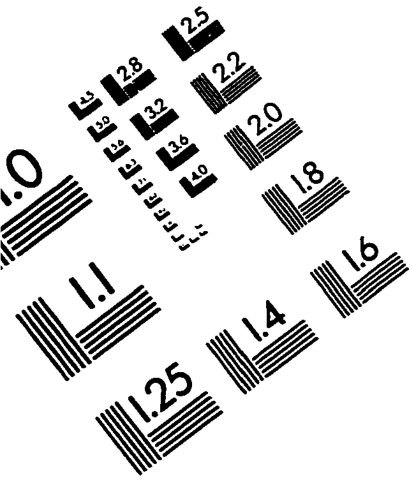
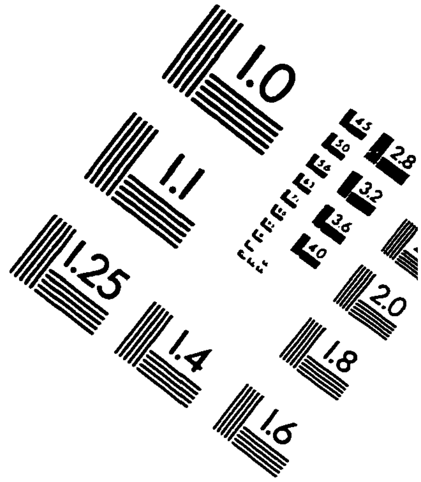
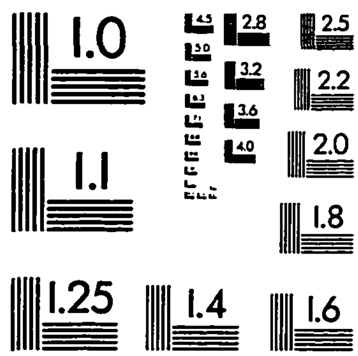
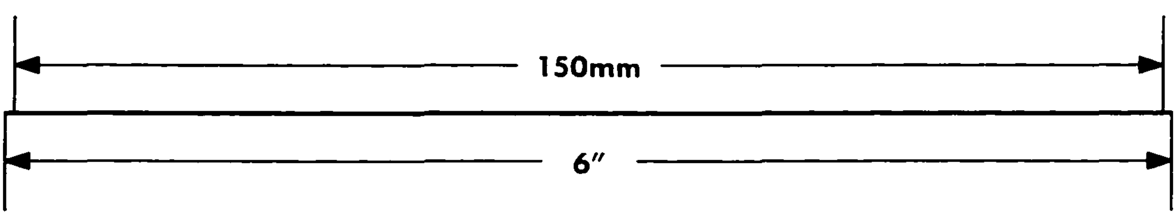
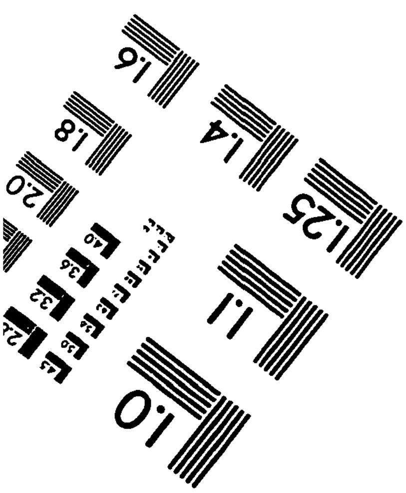
IMAGE EVALUATION TEST TARGET (QA-3)

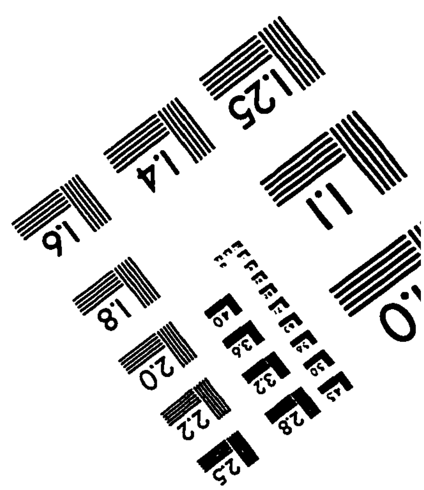












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