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Evaluating the Effectiveness of a Photographic Schedule to Teach Adults with Autism to Use an Apple iPod®

by

Melissa M. Anglesea

A Master's Thesis Submitted to the Faculty of

Montclair State University

In Partial Fulfillment of the Requirements

For the Degree of

Master of Arts in Psychology

January 2010

College/School College of Humanities and Social Sciences

Department Psychology

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Evaluating the Effectiveness of a Photographic Schedule to Teach Adults with Autism to Use an Apple iPod®

Abstract

Many individuals with autism display deficits in the areas of verbal and written language. Picture prompts, in the form of a photographic schedule, can be a useful tool because they can be used in place of verbal and written language. In addition, a photographic schedule can replace prompts from an instructor. Using a multiple-baseline-across-subjects design, this study demonstrates the effectiveness of using a photographic schedule to teach three adult males with autism to use an Apple iPod®. By the end of the study, all participants were able to successfully operate the iPod® to listen to music without prompts from the investigator.

EVALUATING THE EFFECTIVENESS OF A PHOTOGRAPHIC SCHEDULE TO TEACH ADULTS WITH AUTISM TO USE AN APPLE IPOD®

A THESIS

Submitted in partial fulfillment of the requirements

For the degree of Master of Arts in Psychology

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MELISSA M. ANGLESEA

Montclair State University

Montclair, NJ

2010

Table of Contents

List of Figures

Running head: EVALUATING THE EFFECTIVENESS OF A PHOTOGRAPHIC

Evaluating the Effectiveness of a Photographic Schedule to Teach Adults with Autism to Use an Apple iPod®

Melissa M. Anglesea

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Abstract

Many individuals with autism display deficits in the areas of verbal and written language. Picture prompts, in the form of a photographic schedule, can be a useful tool because they can be used in place of verbal and written language. In addition, a photographic schedule can replace prompts from an instructor. Using a multiple-baseline-across-subjects design, this study demonstrates the effectiveness of using a photographic schedule to teach three adult males with autism to use an Apple iPod®. By the end of the study, all participants were able to successfully operate the iPod® to listen to music without prompts from the investigator.

Evaluating the Effectiveness of a Photographic Schedule to Teach Adults with Autism to Use an Apple iPod®

Individuals with autism demonstrate deficits in the areas of communication and socialization. They also show a restricted range of interests (American Psychological Association, 2000). This can be problematic when it comes to teaching new skills. Since many individuals in this population have difficulty understanding written and verbal language, some researchers have used pictures as a teaching tool (MacDuff, Krantz, & McClannahan, 1993; Bondy & Frost, 1994)

Photographic schedules can be useful because they can replace prompts from an instructor. This in turn, promotes independence for the learner. Picture prompts are used by showing the learner a picture of the step to be completed and then prompting them, through verbal or physical guidance, to perform the step. A photographic schedule is simply a chain of pictures depicting each step necessary to complete the task. The purpose of the schedule is to guide the learner to complete the task without prompts from the instructor. Photographic schedules can be made small so that they are discrete and can be used in a variety of settings (e.g., home, school, a day program, a job site, etc.) due to their portability.

Wacker and Berg (1983) taught five high school students with mental retardation to complete vocational tasks using a photographic schedule. Photographs were taken depicting the steps necessary to complete the vocational tasks: two assembling valves tasks, circuit board assembly and a packaging task. The tasks were separated into two training tasks and two generalization tasks. Training sessions were conducted with the

photographic schedule and post tests were conducted with and without the photographic schedules. Data indicated that the photographic prompts were effective in teaching adolescents with mental retardation to complete the vocational tasks. Wacker and Berg found that the picture prompts could be removed without fading following training tasks, but not with the generalization tasks.

Similar results were found in Steed and Lutzker's (1997) study on teaching a man with mental retardation and atypical psychosis to perform three cleaning tasks. However, in this study, the participant did not maintain the skills in the absence of the photographic schedule.

Knowing that photographic schedules can be effective tools to teach vocational skills to individuals with mental retardation, it is proposed that the same strategies could be used to teach individuals with autism a leisure skill. The current study looks to replicate and expand on the Wacker and Berg (1983, 1984) and Steed and Lutzker (1997) studies by using a photographic schedule to teach three adults with autism how to use an Apple iPod®.

Method

Participants and Setting

Three adult males between the ages of 21 and 23 (mean=22) with a diagnosis of autism participated in this study. All three attend a day program serving adults with autism. The study was conducted at a desk in the participant's typical classroom setting. Vineland II Teacher Ratings were performed on all three participants; results are summarized in Table 1. The mean standard score for communication= 51, daily living

skills=60, and socialization=52.3. The mean overall adaptive behavior composite is 162.3.

Vineland Scores	Martin	Gary	Mark	Mean
Communication Standard Score	49	53	51	51.0
Daily Living Skills Standard Score	57	60	60	59.0
Socialization Standard Score	51	53	53	52.3
Adaptive Behavior Composite Standard Score	49	53	52	51.3
Chronological Age	22	21	23	22.0

Table 1: Participants Vineland II Teacher Rating Scores, Chronological Ages, and Means

Materials

Photographs depicting each step necessary to use an Apple iPod Classic® to listen to music were taken with a digital camera, printed out and mounted on 3.5"x 5" index cards. The cards were then laminated and bound into a book (Figure 1). The participants used the Apple iPod Classic®, headphones and a timer. The investigator used a task analysis (Table 2) and a pencil.

Reliability

Both the principal investigator and another trained staff member simultaneously observed the participants following the steps to listen to music on their iPods® while collecting data on the percentage of steps completed independently. At the end of the session, data were compared. Interobserver agreement was calculated by taking the number of agreements divided by the total of agreements and disagreements and

multiplying by 100. Interobserver agreement was assessed for 33% of the sessions at 100% accuracy.

Design and Procedure

A multiple-baseline-across-subjects design with a reversal of photographic schedule and no photographic schedule conditions was used.

Baseline 1. The participant was presented with the instruction, "Listen to music on your iPod® for five minutes." No further instruction or prompts were given. The percentage of steps completed on a 16 step task analysis was scored. If the participant did not make any effort to complete the task for 30 s, the session was terminated.

Baseline 2. The participant was presented with a photographic schedule depicting the necessary steps to complete the task and given the instruction, "Listen to music on your iPod® for five minutes." No further instructions or prompts were given. The percentage of steps completed on a 16 step task analysis was scored. If the participant did not make any effort to complete the task for 30 s, the session was terminated.

Teaching. The participant was presented with the instruction, "Listen to music on your iPod® for five minutes" and given a photographic schedule depicting the necessary steps to complete the task. Using graduated guidance and reinforcement in the form of social praise the principal investigator prompted the participant through the steps to listen to his iPod®. The percentage of steps completed independently on a 16 step task analysis was scored. Criterion was met when the participant demonstrated the skill at 100% accuracy for two consecutive sessions. Additional reinforcement in the form of preferred edibles were used to teach each of the participants to turn off the iPod®, since this step

appeared to present increased difficulty for each participant. Edibles were faded across teaching sessions and were only used for this particular step.

Post-Training Probe. This phase was to determine if the participant could perform the task without prompts or reinforcement from the investigator. The participant was given the photographic schedule and the instruction, "Listen to music on your iPod® for five minutes." The investigator stood 10 feet away while engaged in paperwork to appear unattended to what the participant was doing. No prompts or reinforcement were given during this phase. The percentage of steps completed independently on a 16 step task analysis was scored. If the participant did not make any effort to complete the task for 30 s, the session was terminated. Criterion was met when the participant either scored 100% accuracy on the first probe or scored 100% for two consecutive sessions if he did not score 100% the first time.

No Book. Same as baseline 1. This phase was used to determine if the participants could maintain the skill without the presence of the book.

Return to Book. Same as baseline 2.

Results

The percentage of steps completed independently to operate the Apple iPod® to listen to music are presented in Figures 2 and 3. Results indicate that the highest percentage of steps completed independently during baseline 1 was 13%, 31% and 31% for Martin, Gary, and Mark respectively. When the photographic schedule was introduced (baseline 2), the percentage of steps completed independently increased slightly for Martin to 31%, but did not increase any higher than baseline 1 levels for Gary and Mark.

With teaching (graduated guidance and reinforcement) the percentage of steps completed independently increased for all participants to 100%. It took 31 teaching sessions for Martin, 27 for Gary, and 19 sessions for Mark to meet criterion in this condition. In the post training probe condition, only one participant (Gary) met criterion on the first probe. Martin's accuracy decreased initially, but met criterion by the fifth session. Mark's accuracy ranged from 94%- 100% in the post-training probe condition. After four sessions below criterion, additional training was done on step 11 of the task analysis, since this was the only step he was getting incorrect. Mark's schedule was also altered to have him count to six instead of three, since he was not holding the button down long enough to turn off the iPod®. After seven sessions (four teaching sessions and three probe sessions) below criterion, a voice recorder prompt was introduced. The principal investigator recorded herself counting to three on the voice recorder. Mark was taught to press the voice recorder and the play/pause button on the iPod® to turn it off. He met criterion in this condition using the voice recorder within 7 sessions (four teaching sessions and three probe sessions).

The photographic schedule was removed in the next condition to determine if the participants would maintain the skill without the presence of the schedule. Accuracy immediately decreased for all participants. The highest score for each participant in this condition was 56%, 6%, and 31% for Martin, Gary, and Mark respectively. When the photographic schedule was reintroduced, accuracy increased for all participants to criterion (100%) without any additional training. The lowest score for each participant in this condition was 94%, 38%, and 88%, for Martin, Gary, and Mark respectively.

Discussion

All three participants learned to complete 100% of the steps to listen to music on an iPod® independently using the photographic schedule and teaching in the form of graduated guidance, social praise, and edibles (to turn off the iPod®) during the teaching condition. However, Mark did not maintain this level of responding in the post training probe condition and required additional training as well as a voice recorder prompt. During baseline with no schedule, the highest score was 31% accuracy. When the schedule was introduced, accuracy increased higher than any Baseline 1 score for only one participant, Martin. When the schedule was removed, accuracy scores immediately dropped to near Baseline 1 levels. When the schedule was reintroduced, accuracy scores increased to criterion without any additional teaching.

The results of this study are promising and indicate that a photographic schedule can be a useful tool to teach individuals with autism to use technology such as an Apple iPod ®. Although none of the participants required training to turn the pages of the schedule, they did need training on how to operate components of the iPod® such as how to switch the hold button on and off and how to use the wheel. One participant, Mark, needed additional training and an adaptation to the schedule to turn off the iPod®.

These results replicate and extend the findings of previous researchers (Wacker & Berg, 1983; Steed and Lutzker, 1997). Similar to the Wacker and Berg (1983) and Steed and Lutzker (1997) studies, participants scored well below criterion during baseline and after training, the percentage of steps completed independently increased to criterion. In those studies as well as the current study, a decrease was observed when the picture prompts were removed and an increase in the percentage of steps completed

independently was observed when the pictures were reintroduced. The current study extends the work of the previous researchers because it shows that a similar teaching procedure can be used with persons with autism and it can be used to teach things other than vocational skills.

Wacker and Berg point out that although many training procedures are effective, few are efficient in terms of the amount of training or supervisory time required of staff. The use of picture prompts may be a good solution to this problem because individuals with developmental disabilities can maintain performance in the absence of other training stimuli and they can be used as permanent prompts to continue to guide performance after other training stimuli have been removed (1983). This is evident in the current study.

The effects of leisure on one's well being have been investigated for decades (Slavson, 1946; Tinsley & Tinsley, 1986; Iwasaki, 2001; Sonnentag, 2001). Although the subject has been studied extensively among typically developing individuals, little research exists on the topic regarding individuals with developmental disabilities. It is possible that the correlation between increased leisure time and positive well being would also be found with this population. Future research is needed in this area.

One limitation of this study is that generalization has not been assessed. A second limitation is that the schedule was not faded out. The participants rely on the schedule to accurately operate the iPod ®. Furthermore, Mark required an additional prompt, the voice recorder, which was not faded out. Additional techniques are being investigated to fade out the schedule.

Future studies should investigate ways to fade out the schedules and evaluate if using picture prompts are more efficient than other teaching methods in terms of the amount of time and effort required by both the investigator and the participant. The effect of leisure on well being among individuals with developmental disabilities also needs to be researched.

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Table 2

Task Analysis

Target Objective: Operates an Apple iPod Classic

Participant: _____

Condition: _____

Date:										
1. Gets iPod										
2. Gets headphones										
3.Gets timer										
4. Plugs in headphones										
5. Turns off hold button										
6. "Menu" button										
7. Selects, "Music"										
8. "Selects, "Songs"										
9. Chooses a song										
10. Sets timer for 5 minutes										
11. When timer rings, presses "play/pause" button for 3 seconds										
12. Unplugs headphones										
13. Puts hold button on										
14. Puts iPod away										
15. Puts headphones away										
16. Puts timer away										
Percentage of Steps Completed Independently:										

Figure 1

The photographic schedule used to teach the participants to use the iPod. Note: Page numbers were added to guide the reader; they did not appear on the participants actual schedules. Page 12 shows the voice recorder, which was only used in Mark's schedule.

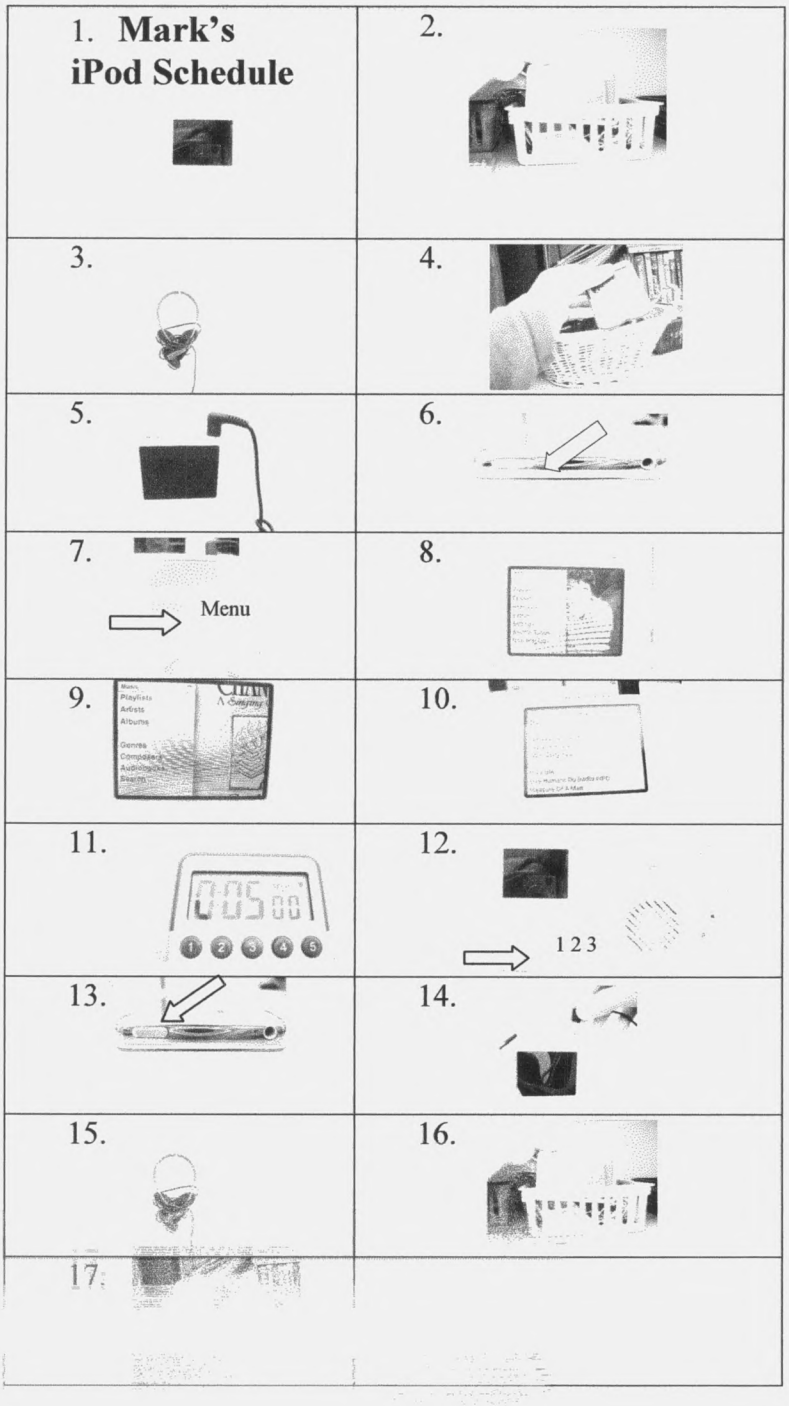


Figure 2

Percentage of steps completed independently to operate an Apple iPod Classic® during baseline 1, baseline 2, teaching, and post-training probe.

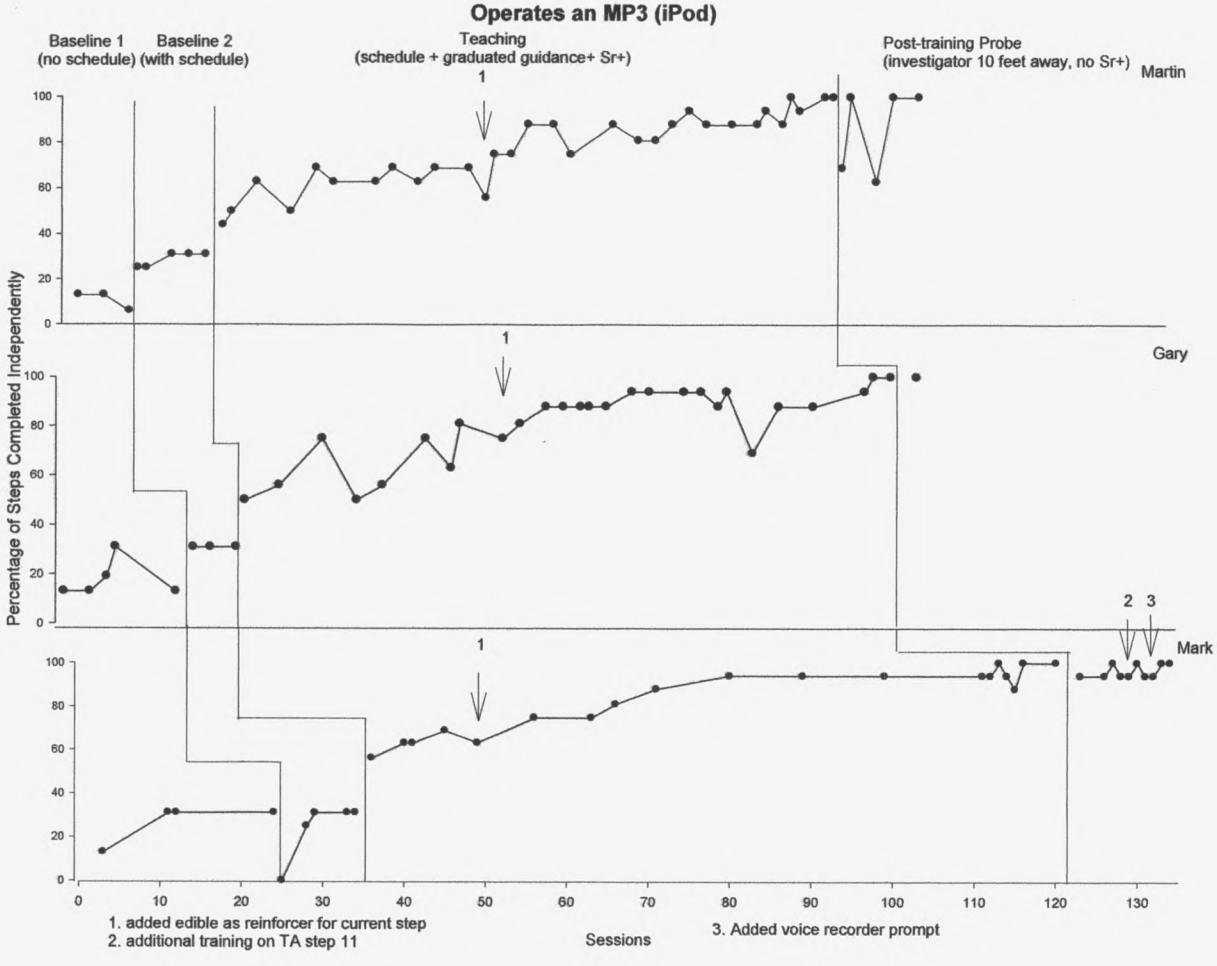
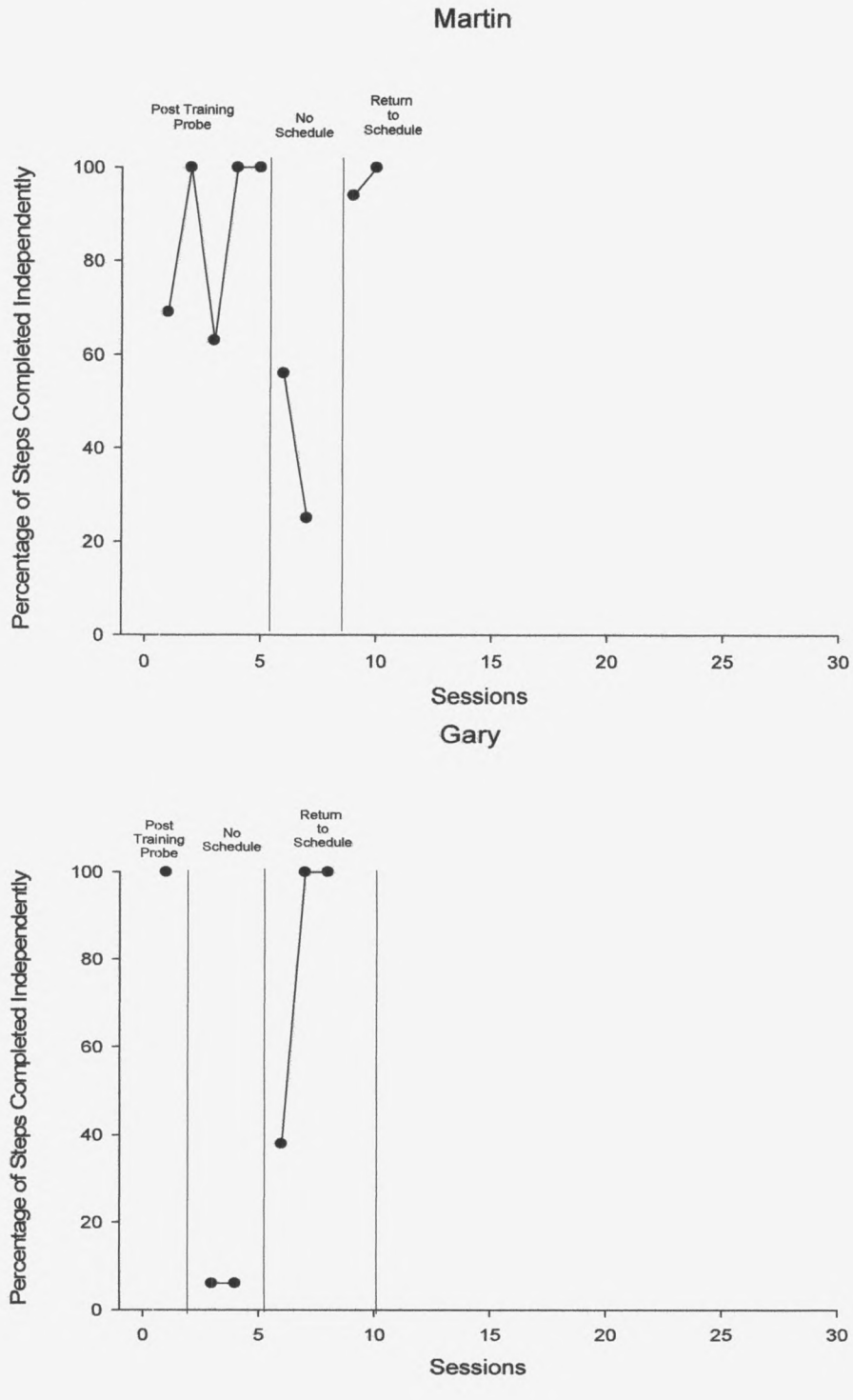
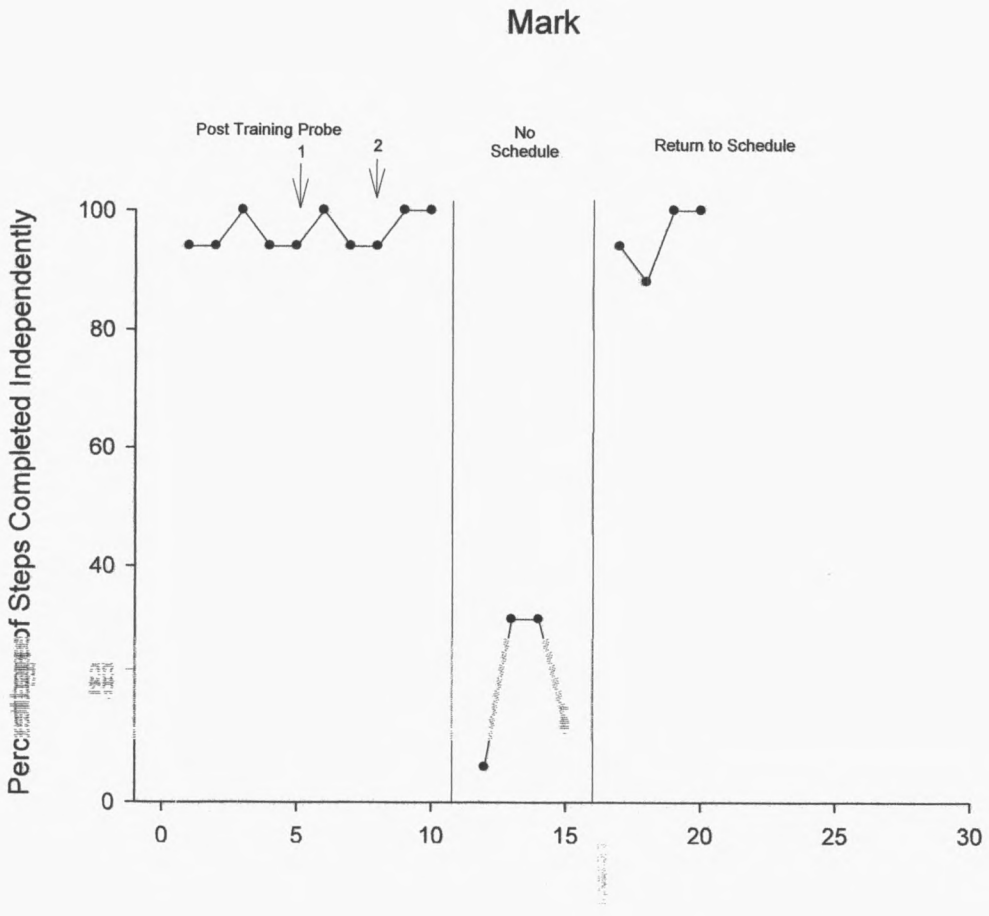


Figure 3

Percentage of steps completed independently during post training probe, removal of book, and return to book conditions.




Mark
Post Training Probe
1
2
No Schedule
Return to Schedule
Percentage of Steps Completed Independently
100
80
60
40
0
0
5
10
15
20
25
30