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Adults With Intellectual Disabilities in a Day Program Setting Using Activity Schedules

Julia A. Hermansen
Utah State University

ADULTS WITH INTELLECTUAL DISABILITIES IN A DAY PROGRAM

SETTING USING ACTIVITY SCHEDULES

by

Julia A. Hermansen

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Approved:

_____	_____
Thomas Higbee, Ph.D. Major Professor	Lillian Durán, Ph.D. Committee Member
_____	_____
Scott Ross, Ph.D. Committee Member	Mark R. McLellan, Ph.D. Vice President for Research and Dean of the School of Graduate Studies

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ABSTRACT

Adults with Intellectual Disabilities in a Day Program

Setting Using Activity Schedules

by

Julia A. Hermansen, Master of Science

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Major Professor: Dr. Thomas Higbee
Department: Special Education and Rehabilitation

Research suggests teaching adults and children with disabilities to follow pictorial cues increases home life skills, vocational skills and on-task behavior. Activity schedules use pictorial cues to prompt individuals to complete behavioral sequences. The purpose of this study was to examine if, after training, adults with intellectual disabilities completed a series of behaviors using an activity schedule. The dependent variable is percent of components completed independently. Three individuals with mild to severe intellectual and physical disabilities receiving services from a private provider day program participated. Each participant used an activity schedule to complete a skill set during training. The results show that, for all participants, an activity schedule increased independently completed steps of the skill set, typing on a computer, as compared to when the activity schedule was not present.

(44 pages)

PUBLIC ABSTRACT

Adults with Intellectual Disabilities in a Day Program Setting Using Activity Schedules

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Often we require calendars and or electronic devices, to remind us to get started on something. Individuals with intellectual disabilities are no different, in terms of needing a reminder to begin a task. However, the reminders that individuals with disabilities receive often come from another person thus making it more difficult for individuals with disabilities to independently complete tasks. In addition, it can be exhaustive of the other person's time and resources that is constantly having to prompt the individual to complete tasks. However, if individuals with disabilities can learn to complete a schedule that prompts them through each step of a task, the schedule then acts as a reminder rather than a person, thus increasing independence and decreasing dependence on others. The present study showed that adults with intellectual disabilities completing task steps independently increased when the activity schedule was present. Moreover, independent completion of task steps increased even more when the activity schedule was present and the prompting procedure was used.

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Julia A. Hermansen

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INTRODUCTION

How many times has your calendar on your phone or computer buzzed at you, to remind you to complete a task or attend a meeting? Often we require calendars, electronic devices, and or the classic "Post It" note to remind us to get started on something. Individuals with intellectual disabilities are no different, in terms of needing a little "nudge" here and there to remind him/her to begin a task. The need for these reminders or prompts often becomes an obstacle to an individual's ability to be more independent, especially, in a day program setting. After individuals with intellectual disabilities graduate from secondary school, many enter day programs designed to promote independence by teaching vocational and independent living skills. According to the Utah Department of Administrative Services, a day treatment program is defined as "means specialized treatment for less than 24 hours a day, for four or more persons who are unrelated to the owner or provider pursuant to Subsection 62A-2-101(4)." (http://www.rules.utah.gov/publicat/code/r501/r501-20.htm#T5). Unfortunately, many day programs may be underfunded and therefore, may be under staffed. It is Utah law that a day treatment program has at least 10 clients to 1 staff ratio (http://www.rules.utah.gov/publicat/code/r501/r501-20.htm#T5). Day program staff may have responsibility over multiple individuals with varying individual needs and the need for individual techniques that work to keep multiple clients engaged. This may produce an unequal distribution of staff attention in favor of individuals with the most severe behavior problems or severe disabilities. Without staff prompting or assistance, individuals with less severe disabilities may not have opportunities to practice

appropriate skills that will help them become more independent. Instead, these individuals may be left to practice routines that may not be socially appropriate in the natural setting. For example, an adult with a diagnosis of autism, if left alone, may continue to engage in stereotypic behaviors (e.g., hand flapping, echolalia, etc.). Acquiring more money in order to hire more staff could be a possible solution; however, in a time of economic trouble this is not an easy solution. An alternative solution would be to use a teaching technology that would allow day program staff to simultaneously teach skills to multiple clients who have different learning needs. One teaching technology that could accomplish this is called Activity Schedules (Krantz, MacDuff, & McClannahan, 1993a).

Activity schedules are a series or set of pictorial or textual prompts that cue individuals to engage in a sequence of activities (McClannahan & Krantz, 1997). Activity schedules may take many forms (i.e. photographs, written, video, etc.) It is important to note that an activity schedule is different from a pictorial cue. A pictorial cue is simply one photograph of an activity or step to an activity that prompts the person to engage in that activity or step of an activity while activity schedules provide multiple visual cues to complete a series of activities or all steps of a multiple-step activity. The activities in a schedule can range from eating a snack to playing a game (Krantz et al., 1993a). Activity schedules have been shown to promote skill acquisition with persons with intellectual disabilities (Morrison, Sainato, Benchaaban, & Endos 2002; Pierce & Shreibman, 1994) with little supervision from staff. The ability for adults with intellectual disabilities to complete activity schedules independently may provide opportunities to learn new skills

or strengthen skills in their current repertoire. These schedules have been used to teach play skills, appropriate on-task behaviors in school settings (i.e. reading), decrease inappropriate behaviors, cooking skills, telling time and even playing video games (Hall, McClannahan, & Krantz, 1995; Johnson & Cuvo, 1981; Krantz et al., 1993a; Krantz, MacDuff, & McClannahan, 1993b; Morrison et al, 2002; Pierce & Shreibman, 1994; Sowers, Rush, Connis & Cummings, 1980), thus providing a tool with which the individual prompts themselves instead of relying on another person to prompt activity completion (Johnson & Cuvo, 1981; Sowers et al., 1980). Research conducted with children with autism using activity schedules is abundant in the literature, especially with the work of Krantz and McClannahan. However, less research has been directed at examining the use of activity schedules with populations other than persons with autism.

LITERATURE REVIEW

The following literature review was conducted through the databases, Psych Info, Google Scholar, and EBSCO. I searched the following keywords (not all in the same search): activity schedule, picture schedules, effects of activity schedules with adults, pictorial schedules, Autism and schedules, effect of schedules with adults with intellectual disability. The search yielded seven articles; three of these pertain to my topic of interest. Next I completed an ancestral search from an unpublished literature review done by a doctoral student. From this review I was able to obtain several more references and search the articles using Google Scholar. I also, searched the references of those articles found in the literature review using the databases listed above. This process was repeated several times to ensure adequate support for claims made in this paper. From this search, I selected the four studies most relevant to my research question. Three of the studies I selected had adults as the participants, took place in a school or vocational training setting. I also, included one study with children with autism as participants because it is a landmark study in establishing activity schedules as a teaching methodology.

The first study, conducted by Krantz et al. (1993a), taught four boys with autism, ages 9, 11 and 14, using picture cues to engage in various activities. They measured occurrence of problem behavior as well as on-task and on-schedule behavior during the activity schedule. Researchers found that while the individual engaged in the activity schedule, problem behavior decreased. In addition, on-task and on-schedule behavior generalized to novel activities and maintained after treatment. This study is noteworthy

for three reasons: (a) rearrangement of picture order; (b) introduction of novel activities; and (c) requiring that the boys point to the picture. Rearranging the order of pictures prohibited the individuals from memorizing the schedule and consequently the schedule did not become a memorized routine. Introducing novel activities allowed for assessment of generalization. Lastly, pointing to the picture is, in essence, teaching the child to prompt themselves to attend to the cue. As a result, the researchers established an activity schedule that taught independence and allowed for continued implementation even after individuals learned the initial tasks (Krantz et al., 1993a).

In a study by Anderson, Sherman, Sheldon, and McAdams (1997), activity schedules with adults living in a residential group home setting. All three participants had mental disabilities and ranged in ages 21-37. Activities taught were recreational, chores or/and personal hygiene tasks. The activity schedules used were either lined drawings or photographs of the participants completing the activities. Participants selected the order of each activity schedule. The independent variable was participating in sequencing the schedule. The dependent variables were maladaptive behaviors and staff prompting. All but one participant's maladaptive behaviors decreased during the activity schedule time and engagement in the activities and sequencing the activities increased during activity schedule times as compared to non-activity scheduled times.

Scheur (2002) used activities schedules with adults with cerebral palsy in a day program specifically for individuals with cerebral palsy. Using a multiple baseline across participants design, three adults ranging in ages 27-49 were taught five different activity schedules. The activities taught were novel to each participant and were leisure and

vocational activities (e.g. puzzles, money cards, matching, peg boards). During baseline conditions, each participant was given one instruction, “Please complete your work”. The activity schedules were present during baseline sessions. Treatment conditions consisted of the instructor giving the same instruction, delivered in baseline, with the activity schedule present. Then the instructor provided gradual guidance prompting procedure to help the participants complete the activity schedules. The instructor delivered tokens fixed ratio schedule one correct response. Tokens and prompts were faded as the participant completed steps independently. After treatment all participants completed the schedules independently at least 80% of each session.

Further, Watanabe and Sturmey (2003) increased independent engagement in activities using schedules. Three adults with a diagnosis of ASD ranging in ages 22-40 participated. The research took place in a community vocational program. In a multiple baseline across participants design, Watanabe and Sturmey (2003) recorded on-task behaviors using momentary time sampling procedure. The tasks outlined in the activity schedules were reading comprehension, math practice, job search, and hygiene tasks. In baseline condition the participants were given the order of the tasks to be completed within the schedule. In the treatment condition the participants chose the order of completion for the activities in the schedule. During baseline and treatment the teacher instructed the participants when to begin the schedules. The teacher provided praise in both conditions upon the completion of a task. If the participant did not finish a task within 40 min then the teacher prompted him to complete the next task in the schedule. In treatment the teacher prompted the participant to make his/her schedule.

Maintenance sessions conducted were run exactly like treatment sessions only on verbal prompts were given. With all three adults, engagement in the activity schedule increased in the choice treatment condition as compared to the baseline-no choice condition across all three participants.

From these studies reviewed, activity schedules appear to be effective in promoting the acquisition of skills and on-task behavior for individuals with intellectual disabilities and specifically for those with ASD. Moreover, they appear to be beneficial in decreasing maladaptive behaviors in adults with disabilities in group home settings and adults with Cerebral Palsy seem to acquire the skill of using an activity schedule. Limitations of the research include, some studies used verbal prompts given beyond the initial instruction. This is a limitation because it is not clear if it was only the activity schedule that caused the behavior change or if additional verbal prompts contributed to the learning of the skill. Moreover, some of these studies interacted with staff during treatment conditions. Therefore it is difficult to say that it was the activity schedule alone that caused the desired result rather than the combination of the schedule and ongoing verbal prompts. In the studies described, individuals with diagnoses of cerebral palsy, autism spectrum disorder, and intellectual disabilities participated. However, in this study individuals not only with a diagnoses of Intellectual disabilities but also, Bi-polar disorder, intermittent explosive disorder, mood disorder and traumatic brain injury participated thus, extending the research of the effectiveness of activity schedules to a wider population.

Purpose Statement and Research Question

Building on the information gained from these four studies, this study examined the effects of activity schedules and associated training procedures with adults with disabilities in a day program setting. The research will answer the question: To what extent do activity schedules affect completion of a sequence of pre-vocational and independent living skills with adults with intellectual disabilities in a day program setting? To evaluate the effectiveness of the activity schedule, we measured the extent to which participants followed the schedule as designed and the percentage of steps of the scheduled tasks they completed independently.

METHODS

Participants and Setting

Three individuals with mild to severe intellectual disability participated in this study, three male participants

Chris is 48 years old and lives in a residential program with 24-hour staff. He is high functioning and has a diagnosis of bi polar disorder, traumatic brain injury, and mild intellectual disorder. He did not exhibit any aggressive behaviors or behaviors that would interfere with the study. He is his own guardian and voluntarily agreed to participate. He had used a computer before but had never used an activity schedule prior to this study.

Roger is 40 years old and he lives in a residential program with 24-hour staff. Roger did not exhibit behaviors of concern that would interfere with this study. He did not have prior experience with an activity schedule. However, he had typed on the computer prior to this study. He has a diagnosis of intermittent explosive disorder, fragile X, and moderate intellectual disability.

Patrick is 29 years old. He has a diagnosis of mood disorder and severe intellectual disability. He also, lives in a residential program with 24-hour staff. He did not exhibit aggressive behaviors, self-injurious behaviors, or aversion to physical prompting that would interfere with this study. He did not have experience with an activity schedule prior to this study to the best of the researcher's knowledge.

All participants are individuals receiving services from a private provider day program. All participants have picture-object discrimination abilities.

I conducted sessions at the day program during the program's regular hours of operation. The day program had groups of which each participant was a part. The groups were out in the community some days and at the day program other days. Thus, I could not run sessions every day of the work week. Due to frequent schedule changes at the day program in the beginning of this study sessions were conducted on Monday, Tuesday, Thursday, and Friday. At the end of the study, the researcher conducted sessions Tuesdays and Thursdays. Each person participated in one-six sessions per week. The day program was located in a large warehouse type building. There were few materials for the individuals to engage with. If the individuals wanted markers, paper, etc. they would have to ask a staff to retrieve the materials for them out of the staff office. There were different rooms in the day program but two of the four rooms only contained a few chairs. I often saw individuals lying on the floor in the rooms. There was a movie room and a computer room. However, clients required a staff to help them use the computers. I observed Chris spending most of his time walking around the large main area with a soda and his music playing. He also, would sit in a chair by the main entrance and look out the window. Roger often walked up and down the main area repeating statements and yelling and other individuals. He carried around an empty 7-11 Big Gulp cup and talked to himself. Patrick often engaged in stealing food, asking staff what time lunch was, walking around the large main area or sitting in a chair at the

main entrance. The sessions took place in the staff office where the computer was located.

Materials

A 1-in. three-ring binder, plastic sheet covers, hook and loop strips, dry sponges, medicine cups, pictures of pre-vocational or independent living skills, one desktop computer and mouse are the materials used in the study.

Consent

The consent form states the purpose of the research, the potential positive and negative effects, and identifies the persons conducting the research. Only those participants for whom consent has been obtained (by legal guardians) will participate in the study. Chris is his own guardian, as well as Patrick.

Dependent Variables and Response Measurement

The dependent variable for the study is the Percentage of Components Completed Independently and is defined as the percentage of the individual activity schedule steps completed without physical guidance from researcher or staff. The steps for each activity schedule are: (a) retrieves activity schedule, (b) opens book, (c) points to picture, (d) completes the step, (e) returns to schedule, (f) turns page, (g) closes schedule, (h) returns schedule. The participants repeated steps c through h for each step. I scored a plus (+) for completing the step without a prompt or a “P” when the

participant completed the step with a physical prompt. If the participant does not begin to complete the step within 5-15 seconds a prompt was provided for the individual to complete the step. I scored the steps for each page of the activity schedule. The activity schedule included seven steps for the activity typing on the computer (including the picture of a preferred edible).

Each participant did the same activity, turning on a computer monitor, opening text word document, typing their name in a text word program , clicking save icon with mouse, clicking “save as” icon with a mouse, and closing the text word document . Each participant did this activity because each enjoyed typing but rarely had the opportunity to do so because they required assistance.

Independent Variables

Activity Schedule

The activity schedule was the primary independent variable. A three-ring notebook which contains pictures of preferred activities and edibles previously identified in the brief Multiple Stimulus (without replacement preference assessment (MSWO). The pictures were placed in front of a black background and into a protective sheet (Krantz et al., 1993a). Each activity was made up of seven pages. The first six pages were steps to complete typing their name on the computer and the last page was an edible reinforcer. Typing on the computer was chosen for each individual because each voiced interest in learning to use the computer. Patrick, often, asked staff to use the computer however, because he needed assistance and because there were few staff

he typically did not get to use it. Chris was high functioning and could get a job. Teaching him to type on the computer would be helpful for him in the future for filling out job applications.

Gradual Guidance Prompting Procedure

I used most to least prompting to teach participants to follow the activity schedule. Upon the instruction "Complete activity schedule" the participant was physically prompted from behind to complete the steps of the activity schedule. No vocal prompts or praise was given at any time during teaching to prevent participants from becoming dependent on verbal instructions from staff. The prompting procedure starts with the most intrusive physical prompt (e.g. lightly guide the hand from the hand to touch the picture) and then gradually fades to no prompt (e.g., hand over hand guidance to touch the picture). In addition, the experimenter gradually increased the distance between herself and the participant as the participant responded independently. When the participant completed a step independently for three or more sessions the hand to hand prompt was faded to hand to wrist if needed. When the participant continues (six or more sessions) to complete that step independently when needed the prompt was faded to hand to forearm. When the participant is completing 80% of the activity schedule independently the prompts was faded to the least intrusive (i.e. light hand to shoulder, hand to upper arm) for those steps consistently completed on their own. No other error corrections procedures were used.

Inter-Observer Agreement

Inter-observer agreement (IOA) was conducted in 30% of the total number of sessions. The formula to calculate point-by-point agreement is the total number of steps of agreement divided by the sum of the steps of agreement and steps of disagreement then multiplied by 100. Another researcher was trained in data collection where the mastery criterion was 90% or higher for successful completion of IOA training (Copper, Heron, & Heward, 2007). I trained the other researcher by reviewing the dependent and independent variable definitions, I reviewed the data collection instructions and then she and I watched recorded sessions and simultaneously took data on the session post facto. We then calculated IOA. When, we scored IOA at 90% or higher for three different sessions the training was considered completed. IOA was conducted across all sessions with 91% agreement.

Treatment Integrity

During 30% of the total number of sessions the experimenter was scored either a plus or minus for proper procedure implementation (i.e. delivery of instruction “go do activity schedule”, pointing to the picture of the schedule, prompting when necessary, providing reinforcement for each step that is completed correctly). The treatment integrity was 92.7% across all sessions.

Experimental Design

An ABAB embedded within a multiple baseline across participants design (Cooper et al., 2007) was used. This design helped control for possible confounding variables across participants. Moreover, the ABAB multiple baseline design allowed for baseline and treatment comparison. We chose to do a withdrawal of the schedule so we could show that the completion of the task was dependent, at least in part, to the presence of the schedule.

Procedures

Pre-Study Assessment

Brief multiple stimulus (without replacement) preference assessment (MSWO) (Carr, Nicolson, & Higbee, 2000). It was important that edible reinforcer items be individually identified for each participant. In order to identify edibles that reinforced behavior of activity schedule completion for the participants, I conducted a preference assessment prior to conducting any experimental sessions. In this assessment, the participant was presented with an array of five items. The experimenter then said “pick one” and waited 5 s for the individual to respond. Once the individual reached toward and touched an item, the experimenter removed the other items and allowed for consumption of the item. The experimenter scored the order in which each item was chosen. The item that was selected was removed from the array of choices. After this the experimenter represented the other four items. This process continued until all five items were chosen. The experimenter used the number one ranked item in the activity

schedule. The picture of the number one ranked item is placed in the activity schedule as the last page. This is to provide a built in reinforcer for the participants after completing the skill set steps. I conducted three preference assessments for Patrick and two for Chris. Chris, after session nine, began asking for different candy. This prompted a new preference assessment to ensure that he would be motivated to complete the activity schedule. Patrick's treatment team, after treatment session two, restricted his caloric intake and he could no longer consume candy. I ran another preference assessment to accommodate his new diet.

Baseline

During this condition, I observed participants in the natural day program setting. No prompts or training occurred. I provided participants with all materials needed to complete the task of typing on a computer. The activity schedule was present. In addition, I provided one single instruction "Complete the activity schedule" to each participant. The researcher recorded each session with a camera. The session terminated after one minute of not beginning to engage in a step. After the researcher watched each recording and coded it for on-schedule behavior and percent of components completed. All participants started baseline session at the same time, except Patrick.

Training

The researcher prepared the activity schedule and set the book near, but out of reach of, each participant. The experimenter, prior to giving the instruction, asked the

participant which edible of his/her two most preferred (determined by the preference assessment) edibles he/she wanted to work for. The one they chose was delivered for independent responses. Also, prior to starting, the edible was placed out of reach of the participant. The experimenter provided a vocal prompt “complete activity schedule”. Then, the experimenter physically prompted the participant from behind to retrieve the activity schedule, place the activity schedule on the table, open the cover, point to the picture with his finger, complete the step (turn on monitor, open windows program, type name, save document, close program, eat snack), pick up the edible item, consume item, turn the page of the edible picture, close the cover, and return the schedule. When all steps are completed the experimenter will provide verbal praise (e.g. “You completed your activity schedule.) The experimenter ignored any attempt of the participant to engage with her (i.e. eye contact) during the completion of the steps of the schedule. In addition no other instruction was given during the session. Small edible items are delivered to a plastic/paper cup from behind for each correct step completed. This was gradually faded as the individual completes steps independently. The experimenter will start with most intrusive physical prompting necessary to complete the task (e.g. gently guiding the arm of the participant by placing your hand on the hand of the participant) and gradually fade its use. Mastery criterion for moving to the removal of the activity schedule was completing 90% or more of the steps independently for three consecutive sessions. One session began with the verbal cue and ended when the activity schedule was completed or 20 min elapsed. Multiple sessions were run in one day with at least 30 min between each session. For each step

completed without a prompt, the researcher delivered a small piece of a preferred edible into a small plastic/paper cup that the participant ate upon completion of the activity. The researcher delivered the edible from behind the participant directly into a cup next to the activity schedule out of reach from the participant. The experimenter placed at least three small edibles in the cup at the beginning of the session so even if the participant required physical prompts during the schedule they still receive reinforcement at the end. However, for each independent response they received an additional edible in their cup. Edibles were faded as follows when the participant completed the activity schedule independently by 80% for three consecutive sessions edibles are delivered for every third independent step completed. When the participant completed the activity schedule steps for at least three consecutive sessions at 90% edibles are delivered every sixth response or in other words at the end of the entire schedule.

Removal of Activity Schedule

After Chris completed 90% or more of the steps independently (no prompts provided), a no activity schedule phase occurred. In this phase, I delivered the instruction “complete activity schedule”; however, the activity schedule was not present (Krantz et al., 1993a). I conducted a no activity schedule phase with Roger and Patrick even though neither met mastery criterion in order to show that although mastery was not met, that the activity schedule did have an effect. After removing the activity schedule to see if the participants still engaged in the skill set, the activity schedule was reintroduced. With the last two participants we conducted a reintroduction phase

without prompts first, followed by an a reintroduction phase with prompts to determine the relative importance of each independent variable.

RESULTS

As expected, during baseline, all participants did not attempt to complete the activity schedule. All participants remained at 0% independent completion of activity schedule steps and 0% of on-schedule behaviors. During baseline, no prompts or teaching occurred. I provided the instruction “Complete activity schedule” no other vocal prompts were given. After the first session of treatment, the steps completed independently increased across all participants.

The first treatment session, Chris completed 19.2% of the activity schedule steps independently. After only nine treatment sessions, Chris reached mastery criterion. He completed the activity schedule at 92% for three consecutive sessions. He made two errors each of those mastery sessions. He typically would not point to one of the pictures or he would not turn the last page after eating the edible. During the removal of the activity schedule condition, upon hearing the instruction, he did not engage in or attempt to type on the computer. The percentage of steps completed independently remained at zero. However, during the reintroduction of the activity schedule phase, after being given the instruction to complete the activity schedule, he kept his hand on the activity schedule and asked “Can I go yet?” After one minute had elapse and he still had not continued to engage in the activity, I terminated the session and ran one more reintroduction of the activity schedule session. During this session, after giving the instruction to complete the schedule, he completed the activity schedule 92% independently. The reason for not completing the schedule after the first instruction during the reintroduction is unknown. However, it is possible that he did not hear the

instruction during the first reintroduction of the activity schedule. After the second reintroduction session, Chris did not return to the day program for one month. Upon his return I ran two more sessions. He completed the activity schedule 88% independently during both sessions. Around session 7 he began asking me for different kinds of candy for his schedule. This prompted me to run another preference assessment. Chris would also say each step to himself as he completed them. It is important to note that during on reintroduction session a pop-up window appeared on screen during the fifth step. Therefore, a prompt was provided on that one step.

Roger did not attempt to complete the schedule during baseline. Moreover, when starting treatment, he went from 0% of steps completed independently to 7%. Roger began combining steps on his own accord. Step 4 and 5 where he clicks the "save" icon and then clicks "save as" he would do as one step instead of two. Therefore, after session 22 I removed step five (i.e. SAVE AS step) from his activity schedule. His score began to increase after this session. For the purpose of this research, it was only required that Roger write his first name. During one session he spontaneously began writing his last name. During session 20, he was interrupted by another client at the day program that Roger reports to staff that he does not like. After this interruption, Roger had difficulty moving on with the schedule and not fixating on this individual. His score went from a 69.2% to 50%. After that session he struggled getting back to 69.2% and staying there. He often complained of headaches, back aches, leg aches, arm aches, running nose, etc. The majority of the sessions, it appeared to be malingering but it is possible that sometimes the complaints were real and this may have impacted his

performance. However, he did continue to increase in independent responses. During session 33 he stopped pointing or touching the picture prompts. It is possible that he was beginning to tire of the activity and all the individual steps required. He was easily distracted. If the researcher bumped him accidentally while prompting, he heard someone sneeze or someone knocked on the door he often would take a while to focus back on the activity schedule. At session 34 he began to level off. We terminated after session 42 due to Roger beginning to level off at 78%. After treatment sessions terminated, I conducted a removal of the activity schedule condition. During this condition the activity schedule was not present and I did not provide any prompts. I delivered the instruction "Complete activity schedule". Although, the schedule was not present, I had only given this instruction in connection to the series of steps for typing on the computer. Therefore, it was not necessary to change my instruction even though the schedule was not present. Also, if I had change the instruction it would not have been clear if it was the instruction change that provided an effect or the activity schedule alone. The session terminated after 1 min of not engaging in a step of the task. Roger, during this phase, completed two steps independently and then stopped engaging. Next, I conducted a reintroduction of the activity schedule phase. No prompts were provided during this phase beyond the verbal instruction "Complete activity schedule". When the activity schedule was present Roger completed the schedule at about 37.4% independently. Finally, I conducted a reintroduction condition with prompts. This condition was conducted exactly like all treatment conditions. I conducted four sessions and ended when Roger reached 73% of components completed

independently which was similar to the levels of performance he had displayed previously.

Patrick went from zero percent during baseline to 15% in his first treatment session. He began to plateau around 38-46%. I conducted four booster sessions to get his responding to increase. I prompted every step in these booster sessions. After the fourth booster session he scored 46% of components completed independently. Patrick often during sessions would say “I want to type” and attempt to type either before or after he’d already completed the typing step. He also reached for his edible reinforcer (i.e. Pepsi) often or would turn the page to the end to obtain the edible reinforcer. After five booster sessions, his score did not increase beyond 46%. He made a few of the same reoccurring errors. He turned multiple pages. Dry sponges were glued to the back of each page so that there was a large gap between each page. In addition, he started to type his first name, last name, date and age. When I prompted him to move on to the next step he refused my prompts. I changed the typing page to include the date, his name and his age so that he was not getting marked down for not completing the step. Also, he often would reach for the reinforcer several times before he completed the activity schedule. I modified the reinforcement schedule where he received a sip (1 ounce) of Pepsi for every 3 independent responses (Variable Ratio 3 schedule of reinforcement) instead of getting it upon the completion of the activity schedule. He, also, began to combine step 2 and step 3. I removed step 3 at session 23. After changing these three areas, his score went from 39% range to 65%. After three sessions at 65% it appeared he was plateauing again. I filled the medicine cups with more Pepsi (2-3

ounces). Thus, he would receive more soda per VR 3. After this change his independent responding increased to 75%. I continued with a VR 3 schedule of reinforcement with 2-3 ounces of Pepsi however, his score slowly began to decrease. I ran another preference assessment with money. He earns quarters at his residential program. However, his score continued to decrease. I ran a preference assessment with candy and Pepsi. He continued to choose Pepsi as the number preference. Thus, we discontinued trials at 50% independent responding. During the removal of the activity schedule condition the activity schedule was not present. I presented the instruction "Complete activity schedule". Patrick performed one step of the activity schedule. The removal of the activity schedule condition was conducted three times. Next, I represented the activity schedule and the instruction "Complete activity schedule". I did not provide any additional prompts during this condition. Patrick completed the schedule about 40% correctly. Next I conducted a condition where Patrick was provided with the schedule and the same instruction as before and this time reinstated the prompts provided in the treatment condition. He completed the schedule independently at about 55%. For Roger and Patrick, although the reintroduction phase with no prompts, show that the activity schedule had an effect, it was not clinical significant. However, the reintroduction phase with prompts show that the gradual guidance prompting procedure plus the activity schedule had a clinically significant effect.

DISCUSSION

The research question driving this study was to investigate the extent to which implementation of the activity schedule and associated training procedures would increase the completion of a prevocational or independent living skill set. This study shows that using an activity schedule increased the participants' ability to type on a computer. With Roger, it was interesting that he began typing his first and last name during treatment, which was not cued by the schedule. Perhaps activity schedules facilitate spontaneous behavior as well. In addition, looking at Figure 1, Roger continued to increase in responding until session 20. During this session, another individual at the day program entered the room. This is an individual that Roger reports to staff that he does not like. After the other client entered the room, he continued to knock on the door. Roger did not respond to the schedule as he had in the past but instead repeated negative statements to himself. After session 20, it took him eight sessions to return to his responding level previous to this session. Also, around this time, his staff began to notice and reported to me that Roger began to say things the staff labeled as "odd". He told staff members that people were bugging him when no one was around him, or that there was a boy in a room when no one was in the room. Staff reported that she had never known Roger to say things like that before. In addition, I noticed only anecdotally, that Roger began to stink near the latter end of sessions conducted. It would be my assumption that he was not showering or not washing his clothes. Moreover, often times during sessions, he had a running nose and this distracted him. Roger's errors

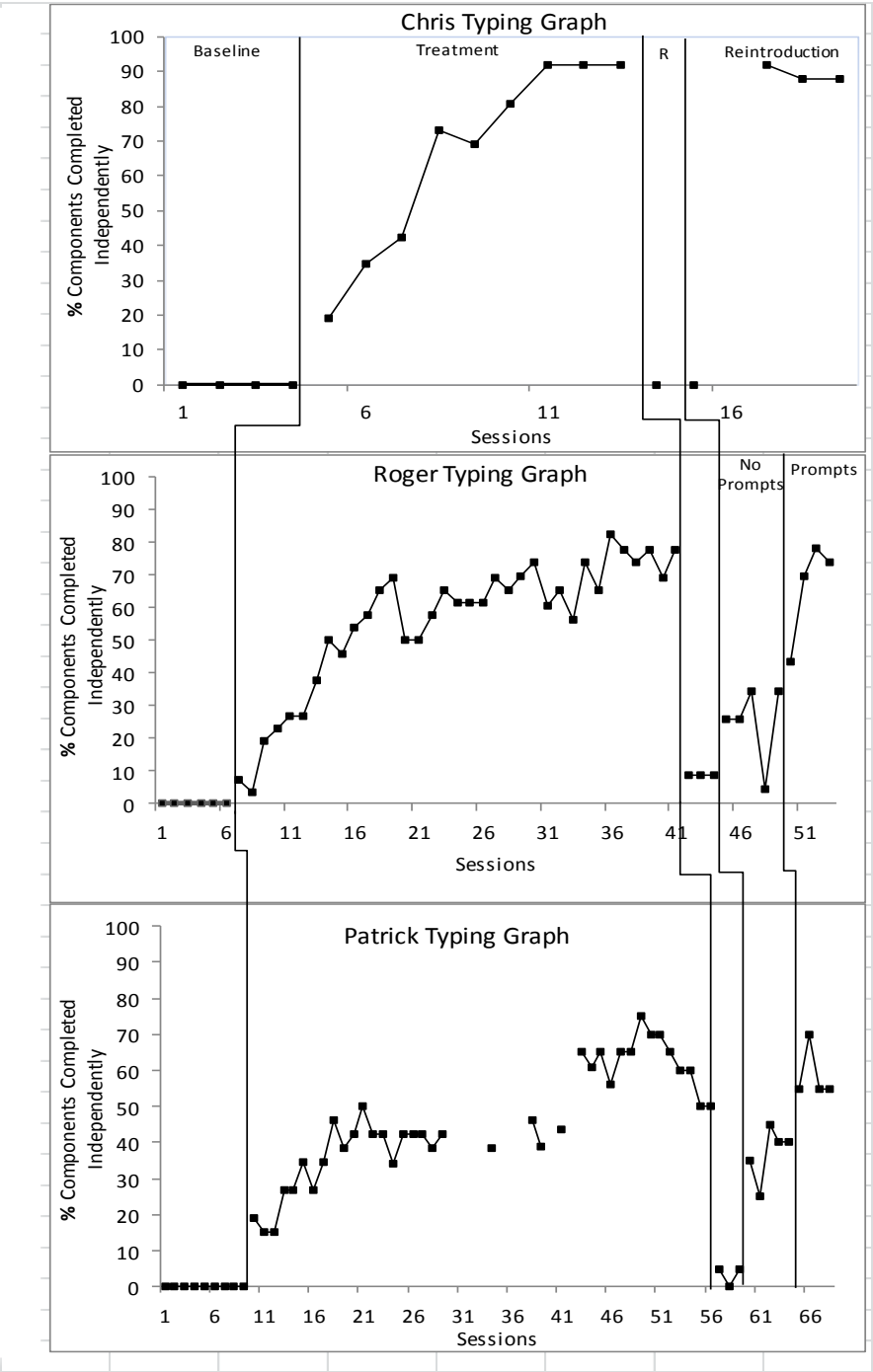

Figure 1. Percent of components completed independently for Chris, Roger and Patrick during baseline, treatment, removal of the activity schedule(R) and reintroduction phases. Roger and Patrick participated in a reintroduction phase with prompts because they did not meet mastery criterion.

consistently revolved around the computer mouse. He either clicked the button too many times or not enough. Also, he usually clicked the mouse in the middle of the left and right buttons which turned the mouse to scrolling. Other errors he frequently made which impeded his ability to reach mastery were (a) stopped pointing to the pictures; (b) spelling his name incorrectly – he often would hold done a computer key too long; and (c) not turning the page before beginning the next step. Perhaps an error correction procedure would have helped Roger reach mastery.

Patrick was motivated to complete the steps he preferred first. This skill is one that might be quite common in everyday life. Often, I myself complete the tasks I want to complete first and save the less desirable tasks for later. Patrick consistently turned the page to the typing page and then the edible page. Patrick began to plateau in the 30-40% range. I changed three things to increase responding (1) I changed the reinforcement schedule to a variable ratio 3. Every three responses on average he received a medicine cup with Pepsi; (2) I put dry sponges on the back of each page to make the pages easier to turn; and (3) I removed step 5 of the schedule. After this his responding immediately increased to the 60% range. Both Roger and Patrick began combining steps and soon not all the original steps of turning on computer and typing then saving the document were needed to complete the whole task. This is desirable in that it shows that activity schedules can teach a new skill and that skill can be retained. Chris was able to retain the skill after a month of not practicing using the activity schedule. The results are consistent with previous research findings in that activity

schedules are an effective teaching tool (Bryan & Gast, 2000; Krantz et al., 1993a; Morrison et al., 2002; Pierce & Sheirbman, 1994).

It is also noteworthy that often times when I asked Chris to participate in a session, if he did not want to participate he often told me. Whereas, Patrick and Roger participated in sessions and never vocalized that they wanted to participate or did not want to in that moment. In addition, in the beginning of the study I conducted sessions two or three times in a day. Roger and Patrick regularly scored lower in the second or third sessions compared to the first session conducted. It is possible that they were tired of the activity.

Roger and Patrick did not meet mastery criterion. Therefore, with the reintroduction phase I conducted two different conditions -one without prompts and one with prompts. Roger and Patrick completed more steps independently when the activity schedule was present as compared to when it was not present. In addition, both completed more steps independently when prompting occurred as compared to when prompting did not occur. Thus, it is shown that the two independent variables are needed to increase independent responding. When the two are present together, the most independent responding occurred. However, it is interesting to note, that during the removal of the activity schedule phase, Patrick and Roger completed at least two steps of the schedule independently without the schedule present.

This study investigated an application of activity schedules that had not previously been researched. In the literature review in this paper, some adults with disabilities acquired skills using pictorial cues and not an actual activity schedule as

described in the Krantz et al. (1993a) article. The two studies that did use an activity schedule as described in MacDuff et al. were conducted with specific groups of adults. One was conducted with adults with cerebral palsy and the other with adults diagnosed with ASD. Investigation of effectiveness of activity schedules with adults with a variety of disabilities and mental health diagnoses in a day program setting is a major strength of this study. In addition, this study taught a complete skill set. Meaning that before treatment each participant required staff prompts to turn on the computer, open text document, save and close the document. After treatment each participant demonstrated independent completion of these steps All participants had the skill of typing their name. However, they did not already have the skills of turning on the computer, opening up text document, saving the document and then closing the program. With this study, all participants acquired these skills by using the activity schedule with less prompting required than when they started. In one instance new skills occurred without previous training (i.e. Roger typing his last name even though it was not pictured in the activity schedule). I noticed anecdotally that Roger engaged in repeated questions and perseverated on people and topics when he was not engaged in the activity schedule. During the schedule, he was typically silent.

Some limitations of this study are that the sample size is relatively small. Moreover, it was impossible to control all the variables that could impact their performance (e.g. other individuals in the day program interrupting sessions). Moreover, because it was a set of steps that never changed in order; thus, it was more likely that the participants would memorize the steps and no longer pay attention to the

schedule. However, this did not seem to occur. Although, two participants combined steps they still attended to the schedule. In addition, it could be a weakness that the no activity schedule phase I used the instruction to complete the activity schedule. If I had told them to type his/her name instead I may have seen some independent responding. Although pre-study probes showed that the only step each participant consistently completed on his/her own was typing of his/her name. Moreover, one prompt was provided during one reintroduction phase when a pop-up box appeared on screen. This could have influenced Chris' responding in an unknown way. Another weakness was the availability of a variety of reinforcers. Patrick was on a restricted diet for the majority of the study and therefore I had to use edibles that did not contain calories. I did receive permission from his nurse to use candy but it had to be candy that was low in calories. If I had been able to use any type of candy this may have increased his independent responding. Further, the computer mouse was difficult for each participant, except Chris, to master due to motor functioning capabilities. Conducting a pre-study probe of each participant's mouse use competency and then teaching the mouse first before the sessions began could have eliminated this problem. Also, for Roger and Patrick I conducted at least 30 treatment sessions and it is possible that they became fatigued of participating in the study.

In future research examination it would be interesting to answer the following questions: (a) does teaching activity schedules increase independent play in the absence of the schedule? (b) Does using an activity schedule with adults with intellectual disabilities decrease problem behaviors? and (c) Does teaching activity schedules

facilitate spontaneous learning? The scientific investigation of these questions will further the importance of activity schedules with adults with disabilities.

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APPENDICES

Appendix A

Percentage of Components Completed Independently.

1. The observer will score a plus (+) if the participant completes the step independently. The observer will score a P for prompt if the participant did not begin to engage in completely step within 5 seconds

2. Prompt is provided any physical guidance in order to assist the participant to complete any step or part of a step. No verbal or gestural prompts will be given.

3. Total the number of steps completed correctly out of the total number of steps for a percentage and record and the bottom of the data sheet.

Name		**Session**		**Date**		**Staff**
Task	**Retrieve Book**	**Open Book**			**Close Book**	**Return Book**
Step: Turn on Monitor	Point to Picture		Complete Step			Turn Page
Step: Open Windows	Point to Picture		Complete Step			Turn Page
Step: Type Name	Point to Picture		Complete Step			Turn Page
Step: Click on Save Icon	Point to Picture		Complete Step			Turn Page
Step: Click on Save as Icon	Point to Picture		Complete Step			Turn Page
Step: Click on X close program	Point to Picture		Complete Step			Turn Page
Step: Snack/ Drink	Point to Picture	Retrieve Snack/Drink	Complete Step			Turn Page
TOTAL	# ____Steps Completed Independently	#____ total steps	_____%			

Appendix B

Treatment Integrity Data Sheet

Session	Did observer provide only the one verbal prompt to engage in activity schedule?	Did Observer score data every 20 s?	Did Observer provide physical prompts when participant was not on-schedule?	Did observer score each step of activity schedule?	Did the observer provide brief statement of praise when schedule was completed independently?
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Appendix C

Brief Preference Assessment (MSWO)

1. Select five edible items.
2. Cut each item into four small pieces
3. Give the participant one piece of each of the five items
4. Present one of each of the five items in front of the participant
5. Gain participants attention
6. Then present the Sd " Pick one"
7. As soon as the participant reaches for one item REMOVE the other remaining items
8. Then allow the participant to consume while you
9. Score the first item as a number one in the first column
10. Then present the remaining four items and follow steps 6-9 until all items are consumed.
11. If the participant does not choose an item within 30 s remove all items from the table and represent the items in the same order.

Item	1	2	3
1			
2			
3			
4			
5			