THE EFFECTS OF A TIMER AND MYSTERY MOTIVATORS ON THE INDEPENDENT DRESSING HABITS OF A FOUR YEAR OLD GIRL

by

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled, ***The Effects of a Timer and Mystery Motivators on the Independent Dressing Habits of a Four Year Old Girl by Dawn Cross***, Candidate for the Degree of Master of Science in Education, Department of Curriculum & Instruction, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

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Abstract

A beat the clock game consisting of gradual reductions in time limits and contingent mystery rewards were used to improve the independent dressing habits of a four year old girl. The study was done in the participant's home with her mother as the researcher and primary data collector. Five days of initial baseline data indicated that it took on average 17 minutes for the child to dress in the morning and a mean of 10.4 prompts were required to get her to do so. After baseline data stabilized, a changing criterion design was used to gradually reduce the amount of time allocated for dressing. On days when the child met pre-established criteria, she was allowed to color a square to possibly reveal an invisible letter. If the letter appeared, then she won a mystery prize. Results indicated that daily dressing time was reduced from 17 minutes to about five minutes and the number of required prompts dropped from 10 to about one per day. One- and two-week, follow- up data showed partial maintenance effects. Implications for future research and practice are provided.

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Introduction

Most normally developing children are able to dress themselves *independently* by the age of four or five years old with the exception of a few more complex physical skills (e.g., tying shoes, buckling belts, and combing hair) (Rock, 2012). Independent dressing skills, in turn, improve children's gross and fine motor skills, increase their sense of accomplishment and self-worth, and free-up care-takers to complete other parenting duties. The good news is that most preschoolers master these skill sequences by the time they turn five and numerous teachable moments are available for parents to capitalize on while teaching their children to dress themselves. For example, while putting arms and hands through shirt sleeves and pulling up zippers, children can also learn to identify and match colors, recognize differences between warm and cool clothes, and make mature choices about how to present themselves in public (Rock, 2012). Unfortunately, some children experience difficulties learning to dress themselves independently (Gargiulo & Kligo, 2010). These difficulties may emerge from individual disabilities, a lack of proper training and support, and/or unknown contributors that impede effective teaching and learning. Irrespective of cause, the result is often negative interpersonal interactions among parents or care-givers and their children that often escalate into more aversive experiences for everyone involved. In addition, children may be ridiculed at school, become overly dependent on adults, and may be less appealing classmates for peers (Gargiulo & Kligo, 2010). A failure to learn to dress oneself independently, therefore, constitutes a legitimate educational target for intervention (Kennedy, 2005).

The purpose of this study was to improve the independent dressing habits of a four-year old girl. More specifically, an attempt was made to reduce systematically the amount of time and number of prompts and reminders required for this young lady to complete dressing without

direct parental assistance. Long delays while dressing, excessive dependency and complaining, and occasional refusals to dress resulted in the use of multiple prompts, increased stress levels, and less than pleasant interactions between mother and child. She was also late for school from time to time. The present investigation, therefore, examined the effects of a behavioral intervention package consisting of (a) daily timings; (b) gradual reductions in time limits; and (c) mystery surprises for "beating the clock" on the amount of time and prompts required to dress appropriately and independently. Each intervention component had empirical evidence to support its efficacy however these elements were *not* combined into an intervention package nor applied in an authentic setting to facilitate independent dressing. The following illustrative literature review highlights the importance of independent dressing skills and describes some representative efforts to help children in this domain.

Improving Young Children's Independent Dressing Skills

Given that many children struggle with independent dressing and numerous parents have struggled to help their children in this self-help area, researchers and practitioners have developed a number of approaches to improve these important skills. It is noteworthy, however, that most dressing-related interventions were created for young children with special needs (e.g., autism spectrum disorders, visual impairments, and physical and orthopedic disabilities). Significant among these approaches were (a) contingent rewards (e.g., mystery motivators) (Robinson & Sheridan, 2000); (b) activity-based interventions (Ozen & Ergenekno, 2011); (c) timers and feedback (Ayllon, Garber, & Pisor, 1976); and (d) educational technology (e.g., computer-assisted instruction, buzzers, and video technology) (Atici & Polat, 2010; Bayrak & Bayram, 2010).

Use of Video Technology to Improve Self-Help Skills. Educational technology (e.g., computers, iPads, and timing devices) has been utilized in schools for years to improve pupil learning and reduce behavioral difficulties (Atici & Polat, 2010). Technology has been used, for example, as an *incentive* to foster pupil motivation, an *instructional tool* to promote independent student functioning, and as a *system* to monitor pupil progress in school (e.g., Atici & Polat, 2010; Bayrak & Bayram, 2010). Classroom technology can range from simple devices like kitchen timers and golf counters to more elaborate and complex computerized learning systems. This wide range of technological products also allows teachers to differentiate instruction, provide independent work time, assist struggling students, and improve interpersonal behaviors. This section examines how teachers incorporate technology into their classrooms, use it to motivate students, and more specifically how they use it to improve student performance in areas such as task completion, accuracy, and speed.

An initial study (Bayrak & Bayram, 2010) examined the effects of computer-assisted instruction (CAI) versus direct instruction on 28, 8th grade students' science knowledge. Using a pre- and post-test, between-group design with 30-question assessments on acid-base balances, researchers found, "a significant difference between the control and the experimental groups regarding students' achievement" (p. 237). Students in the experimental group (i.e., computer-assisted instruction), for instance, outperformed their control group (i.e., direct instruction) to statistically significant levels. Based on post hoc analyses, the researchers concluded that, "computer aided teaching methods had a positive effect on students' academic achievement" (p. 237).

A few years earlier, Fuchs, Fuchs, Hamlet, Powell, Capizzi, and Seethaler (2006) conducted another study examining the effects of CAI on student achievement. Here, the lowest

achieving students in nine, 1st grade classes were chosen to participate. Thirty-three students were assigned to a computer-mediated treatment in math and spelling that was referred to as FLASH. Participants were supervised in FLASH sessions for 10 minutes per day, three times per week for 18 weeks in either math lessons focusing on addition and subtraction facts, or spelling using the first 200 words from the first grade Dolch list. Results showed, "differentially strong improvement in addition achievement, but no significant effect in subtraction from pre- to post-tests" (p.472). The researchers suggested that the insignificant effects in spelling may have been a function of insufficient instructional time allocations. For spelling, the post-test revealed, "significant effects of treatment, with the spelling FLASH group children reliably outperforming the math FLASH group" (p.472). Fuchs et al concluded that

> across arithmetic and spelling skills, the results of this pilot study suggest the potential for computer-assisted instruction to enhance outcomes among high-risk first graders when those children are supervised to ensure adequate use of the software (p. 474).

In a later investigation, Atici and Polat (2010) looked at combining CAI with teacher direction in a study involving 45, 8th grade Turkish students with internet connections at home. Students were divided into three groups (i.e., online lesson alone, online lesson with in class instruction, and control) of 15 participants. All participants took a pre-test, then were taught a common science lesson and were then given a post-test. Researchers found that there was, "no meaningful difference" (p. 456) between the pre- and post-test scores across the three groups. However, they did determine that when post-test scores in each group were averaged, the CAI plus in class instruction produced the highest mean gains. The researchers concluded that, "the online instructional applications have a success-increasing characteristic whenever it is used

together with the traditional education applications" (p.463). They also reported that the completely online group often felt anxious and unsure of the technology, which may have affected their ability to learn. Atici and Polat suggested, therefore, that any further research with online learning should provide student training in technology use.

Another study (Kemker, Barron, & Harmes, 2007) examined the effects of classroom laptop usage among students enrolled in low socioeconomic status (SES) elementary schools (i.e., 74% of students received free or reduced lunch). The school was supplied with enough computers for each student, and one class was observed to see how laptop usage affected students' academic achievement. There was no control group. At the end of the observation, the researchers reported:

> The infusion of the technology in her classroom resulted in increased achievement by the students. She felt that the laptops 'enhanced the lessons a lot and that the wireless part of the technology [made] all the difference. Using the computers as tools for writing, data analysis, communication, and research encouraged students to read, write and solve problems more effectively (p. 318).

In another related investigation, Cobb (2010) studied how teachers perceived the effectiveness of direct instruction, whole group, and/ or differentiated instruction on small learning groups' use of internet-based technology. The researcher surveyed teachers in a large urban district in the Northeast to determine how they were using the Compass Learning Internet-based software (http://www.compasslearning.com/). The school district had just implemented this software to assist teachers in differentiating instruction. Teachers were asked about how often they used certain software components. The researcher concluded that by using the software, "differentiated

instruction has proven to be a valuable teaching model for teachers at urban schools…Teachers are able to use technology to differentiate instruction in reading" (p.43). Cobb (2010) wrote further that

> differentiated instruction with technology is an effective tool for urban school students because the Compass Learning software has key assessments that are based in the ability of the students. Teachers are able to modify student progress and students are able to work together to achieve goals (p.43).

This particular study showed that specific software programs (e.g., Compass) allow students with varied levels of proficiency to learn at their own pace and provide teachers with a valuable tool for differentiating their instruction.

Other empirical studies have examined the effects of technology usage as a *reward* or *incentive* to improve students' academic or behavioral performance. Tiger, Bouxsein, and Fisher (2007), for example, looked at the effects of a token reinforcement system on question-answering in class. The participant was a 19 year old boy diagnosed with Asperger syndrome who was asked to answer questions quickly (i.e., within 9 seconds) in order to receive tokens. For each token the participant earned, he was allowed to watch 30 seconds of a preferred video, thereby integrating technology into the intervention package. Results showed that the target student decreased his mean response time of 40 seconds to less than one second per question. There was also no change in response accuracy for easy questions, although the student did use "I don't know" more rapidly when the intervention was in effect.

In an early seminal study, Schmidt and Ulrich (1969) examined the effects of an electronic sound level monitor (i.e., timer and buzzer) on the disruptions and noise levels in a 4th grade classroom. A timer and buzzer signaled when noise would be monitored and a whistle

sounded if students exceeded pre-set sound limits. If students did not exceed pre-established sound limits, then they were rewarded with extra gym time. The researchers reported that classroom noise levels decreased from a mean of 48 to 37 decibels during both intervention phases. In the second part of the study, researchers looked at how many verbal reprimands were directed toward students during baseline and intervention. They found that teachers significantly decreased the number of reprimands and concurrent changes occurred in pupils' disruptive behavior rates.

Use of Group Contingencies, Timer, and Mystery Motivators. Some researchers have also examined the effects of group contingencies, timers, and mystery motivators or unknown rewards on pupil behavior and academic performance (Rhode, Jenson, & Reavis, 1993). For example, Murphy, Theodore, Aloiso, and Alric-Edwards (2007) used group contingencies and mystery motivators to reduce disruptive behaviors among a group of pre-school children. The children's behavior was monitored in a Head Start classroom and they received check marks each time they engaged in pre-defined disruptive behaviors. If all children received five or fewer check marks, then they received rewards such as a favorite game or activity. Results showed an immediate and noticeable decrease in disruptive behaviors from baseline, but also showed that during the reversal phases, the behaviors returned to the levels they were at during prior baseline conditions. Murphy et al. suggested that this showed that preschoolers learned new behaviors as a result of the mystery motivator intervention.

A second mystery motivator study was conducted by Robinson and Sheridan (2000) who examined the effects of this intervention on four children (i.e., ages 5 to 8) enrolled in a local daycare facility. Three boys and one girl participated in a 33-day program in which their parents were trained directly (i.e., using a treatment manual, role-playing, and knowledge-based quizzes)

to use mystery motivators at home. Following initial baseline, mystery motivators were provided to children who reduced the amount of time that they were in bed but not sleeping. Results indicated that three of four target children decreased significantly the number of non-compliant behaviors and the amount of time that they were out of bed. The largest decrease was reported for one child who reduced time out of bed from almost 100 minutes per night to approximately one minute and non-compliance from 100% to 10% of observed intervals. Follow-up visits showed that behavioral improvements were maintained for one child, while the others regressed to previous baseline levels.

Other studies have also looked at the effects of timers and reducing time limits on children's response latency and dawdling behavior. Donohue, Casey, Bicard, and Bicard (2012), for instance, examined the effects of time limit reductions on children's response latency in task completion. This study was a partial replication of earlier work conducted by Tiger et al. (2007). Donahue used a changing criterion design to systematically decrease the amount of time that the participant took to answer questions. The goal was set at three seconds and was achieved by systematic time reductions from 10 to four to three and eventually two seconds. When participants met pre-established time limits, they were provided with contingent rewards. Student response speed decreased from a mean of 4.6 to 2.9 seconds during the final intervention phase. This particular study showed that a combination of systematic reductions in time limits and tangible rewards can be used to improve response speed among younger children with special needs.

In a similar study conducted over an entire year, Drabman and Wurtele (1984) examined the effects of a "beat the timer" game on the time required for a preschool class to clean up toys and get ready for the next activity. A A-B-A-B withdrawal of treatment

design was utilized to examine the effects of giving children explicit time limits when asked to clean up toys and come sit in a central area to await the next activity. The teacher wanted time reduced from a mean of almost 12 minutes (i.e.11.6 minutes) during baseline to at least four minutes during intervention. Children met the pre-established goal approximately 72% of the time. Moreover, the average time for days that the goal was not met was only 5.7 minutes; a significant reduction from initial baseline levels. Pupil response time averaged 4.3 minutes while the intervention was in effect; an effect that was quickly noticed and sustained by students and teachers throughout the school year.

In a similar investigation, Drabman, Kelly, and Wolfe (1981) used a "beat-the-buzzer" intervention to reduce excessive dawdling and non-compliance during morning dressing activities. Here, target children and their parents engaged in a series of coercive and escalating interactions around getting dressed in the morning. In this particular case the parents were already referred to a local child welfare agency for investigation into suspected child abuse. The parents discussed the difficulties they were having with their two children (Mary, age 4 and John, age 9) and targeted morning "getting ready for school" behaviors as their biggest challenge. At times it took their children more than 45 minutes to get ready for school; there were frequent arguments among parents and children and among children themselves. Researchers taught the mother how to use the beat-the-buzzer game and contingent rewards to improve her children's morning behavior. The mother was also told not to scold, criticize, or threaten the children during the game and to praise them for acceptable behavior. She was also instructed to ignore fighting and arguing and to remind children of the remaining time. If the children were

ready for school within the 45-minute time limit, then they were rewarded. If they did not meet the time limit, they were simply told that they did not earn the reward and that they must try harder next time. There was no punitive consequence for not meeting the goal. Researchers found that the beat-the-buzzer game successfully reduced getting ready time from baseline levels of 80 minutes (Mary) and 55 minutes (John) to about 38 and 29 minutes respectively during intervention. Drabman et al reported further that positive behaviors persisted and follow-up calls to child welfare agencies were eliminated.

In a final related study, Adams and Drabman (1995) looked at the effects of a beat-the-timer game on the morning latencies and interactions of a boy with multiple disabilities. The subject was a 12 year old boy who was diagnosed with significant cognitive and developmental delays. He lived with his grandmother and he and his mother were having increasingly difficult mornings. Although the child reportedly liked school and wanted to attend, he took excessive amounts of time and numerous reminders and prompts to get ready in the morning. These difficulties often led to coercive interaction patterns at home that increased adult and child stress levels and often resulted in him being late for school. Specific difficulties included (a) refusing to get out of bed; (b) arguing; (c) making excuses; (d) refusing to get dressed; (e) crying; (f) whining; and (g) going back to bed. A treatment package was developed that included a timer game and contingent consequences for meeting and not meeting goals. Each morning when the child woke up, a timer was set for the amount of time before s/he left for school. Baseline assessments indicated that, on average, the child took about 55 minutes to get ready for school. The child was given a checklist of "getting ready" behaviors required

to be ready for school. During intervention, the mother was only allowed to remind the child twice about remaining time and/or tasks to be completed. She did, however, praise his appropriate behaviors whenever they occurred. If pre-established goals were met, the child received a preferred treat; if he failed to meet the goal then he had to go to bed 30 minutes earlier for *each* minute he was late (e.g., two minutes past goal = 60 minutes earlier to bed). During baseline, the child never met pre-established time goals. However, during intervention and follow-up, he was on time 93% and 84% of the time respectively. His average preparation time dropped from 93 minutes in baseline to about 52 and 50 minutes during treatment and follow-up. There was also a decrease in negative interactions from a mean of 5.6 negative behaviors during baseline to .1 inappropriate behaviors during intervention. The child's mother rated the intervention as successful and said that it was relatively easy to use.

Collectively, the aforementioned research studies showed that a variety of procedures can be used to improve children's academic and behavioral performance, including the improvement of self-help skills like getting ready for school in the morning. The purpose of the present study, therefore, was to examine the effects of an intervention package consisting of daily timings, systematic reductions in time limits, performance-based feedback, and mystery motivators on the dressing behavior of a four year-old child during morning dressing routines. More specifically, the study examined the following questions: (a) what effects, if any, will the Beat-the-Clock game have on the amount of time and number of prompts required for the target student to dress completely and independently? and (b) how will the target child rate the Beat-the-Clock intervention in

terms of the *importance* of intervention goals, *acceptability* of intervention procedures, and *satisfaction* with intervention outcomes?

Method

Participants and settings

The participant was a four year old, normally developing and healthy girl. She lives with both biological parents and an older sister (age 10) in their own home. They are all Caucasian middle socio-economic status, and have no history of developmental or emotional issues. The only troublesome spot is morning dressing sessions which have evolved into long, drawn-out and stressful interactions for mother and daughter. The child becomes easily distracted and gets off task often while dressing. This causes the mother to continually re-direct and remind her to keep dressing. These interactions, in turn, interfere with the mother's normal routine of providing assistance for another child so they are on time for respective daily activities. These challenges have persisted and even escalated over ensuing weeks and months. The intent was to improve the child's independent and appropriate morning dressing by playing a beat-the-clock game and providing mystery surprises for successful completion of dressing-related goals. The child was chosen because of the increased stress levels that both she and her mother were experiencing during morning routine and to decrease related tardiness for school.

All baseline and intervention sessions were carried out in the family home (living room) when and where normal morning dressing occurred. Research data were gathered during dressing time during regularly scheduled family morning routines. The sequence, location and amount of clothing were held constant across baseline and intervention sessions and data were only collected on school days (i.e., weekends were not included in the treatment or data collection sessions).

Dependent Variables

There were two dependent measures of the child's independent and appropriate morning dressing skills. The first was the total amount of time required to dress completely and appropriately. A stop watch was started immediately after clothing was set out and she was told to start dressing until everything was on except for her shoes. Assistance was given for developmentally difficult tasks such as fastening pants and straightening socks. When she had completed dressing, the stop watch was turned off and the total amount of dressing time was recorded on data collection form (see Appendix A). Appropriate dressing criteria included (a) having clothing on appropriate body parts; and (b) articles on front-first and "right" side out. The second dependent variable was the number of verbal and physical prompts (i.e., reminders and re-directions) that were provided during morning dressing sessions. Prompts consisted of any adult-initiated verbalizations, gestures, and/or physically guided assistance that was provided directly to the target child during daily dressing sessions. Physical and verbal prompts were recorded using a standard golf counter. Frequency data were then converted to rates by dividing the number of total reminders by the amount of dressing time multiplied by 100%. The length and nature (i.e., positive and/or corrective) of adult-initiated prompts was not measured.

To ensure that data were being collected accurately and reliably, a second observer independently completed data sheets during 25% of randomly selected intervention sessions. The two independent ratings were then compared on an *item-by-item* basis. If both observers recorded the same or similar time(s) and reminders (i.e., within 3 seconds and 1 prompt), then it was scored as an *agreement* (A). If independent scorings differed by more than either criteria, they were scored as *disagreements* (D). Inter-scorer agreement was then calculated as the number of agreements divided by the number of agreements and disagreements times 100%. Inter-rater

agreement was calculated separately for dressing time and prompts. Mean agreement levels were 100% for dressing time and 90% for prompts. This information suggests that data were collected in an accurate and reliable manner over the course of the investigation.

Independent variable

The independent variable was a multi-component intervention package (i.e., beat-the-clock game) that consisted of (a) daily timings with systematic time reductions; (b) performance-based feedback; and (c) contingent rewards in the form of mystery surprises. The beat-the-clock game was introduced to the child as a fun way to get dressed faster and with less help. Each morning, her clothes were laid out in the living room. A large, count-down timer was displayed prominently in the living room and set for a pre-determined time limit (e.g., 12 minutes). Daily time limits changed based on measures of the child's previous performance. The first time limit reduction, for example, was set 25% lower than initial baseline levels (i.e., baseline dressing time averaged 16 minutes); initial intervention criterion levels, therefore, were set at 12 minutes. No criteria were established for prompts or reminders. Criterion levels for dressing time were lowered by another 25% after the child met or exceeded criteria for a minimum of three, consecutive mornings. The overall intent was to reduce dressing time to five minutes or less and to observe if the decrease in time also decreased or eliminated most, if not all, physical and verbal prompts.

At the end of each session, the child was also given feedback on her performance. If she met daily criteria she was told, "great job you beat the clock" and/or "way to go you didn't need too many reminders" and she was allowed to color in a square on a grid that had hidden X's that would appear with a developer marker. If the child found an X while coloring in her square, then she was allowed to select a mystery surprise from a grab-bag (Rhode et al., 1993). On days when

she failed to dress before established time limits expired,then she was simply encouraged to try harder the next day.

To ensure that the intervention was implemented as intended, a 5-item procedural fidelity checklist was developed (see Appendix B). This checklist was used to initially train the child in the use of the intervention and monitor the accuracy with which it was implemented over the course of the investigation. During 25% of randomly selected intervention sessions, a second observer watched the investigator implement the beat-the-clock game and recorded which procedural steps were completed and/or omitted. Fidelity of implementation was then calculated using the formula: number of procedural steps present divided by the number present and absent times 100%. The intervention was implemented with 100% fidelity over the course of the investigation.

Experimental design and procedures

A changing criterion design was used to examine the effects of the beat-the-clock game on the independent dressing behavior of a four-year old target student. This particular design is capable of establishing cause-and-effect relationships by showing that child performance changes in predicted directions, when and only, criteria for reinforcement are varied (Kennedy, 2005). The study began with a series of initial baseline sessions. During a typical baseline, the child's clothing was laid out on the couch for her in the usual placements and she was asked to get dressed as quickly and neatly as possible. The investigator monitored her performance from a short distance and provided ongoing feedback, positive and corrective, while she and other family members continued with their morning routines (e.g., grooming and dressing). A stop watch was started at the beginning of each session and stopped when the last article of clothing (without shoes) was completed. The investigator provided a verbal and/or physical prompt each

time the child appeared to stop dressing, was off task, or engaged in some other behavior than dressing. Baseline data were used to determine if a significant dressing problem existed, set criteria for the beat-the-clock game, and compare against intervention data. After initial baseline data stabilized, the beat-the-clock game was introduced.

A typical intervention session proceeded as follows. On the first day, the young girl was told that she would be playing a beat-the-clock game. To win a mystery surprise she had to dress completely and appropriately before the clock rang. Each session started with her clothes laid out in the typical arrangement in the living room and a timer set to a pre-established interval clearly visible in the living room. She was told that the goal was to dress as quickly and neatly as she can, and if she beats the clock then she would be allowed to color a square and possibly pick a mystery surprise from a grab-bag displayed prominently in the living room. The target child was also told that if she wanted to stop playing the game at any time that she can do so without anything bad happening. If she refused to play the game or stopped before she was completely dressed then these data were recorded and treated as either an interspersed baseline or partial intervention session. This did not happen during the investigation.

Using initial baseline data as a guide, the investigator *gradually* reduced the amount of time needed to earn a mystery surprise. On days when she met or exceeded the criteria (i.e., beat-the-clock), she was allowed to color a square on the grid with a developer marker. If she found an X, then she could select a prize from a bag containing paper slips with the names of pre-selected "mystery surprises" written on them. It was anticipated that the first reduction would be 25% lower than initial baseline levels. Baseline dressing time, for example, averaged 16 minutes; therefore, an initial criterion level of 13 minutes was set. The intent was to reduce dressing time to five minutes or less and to eliminate most, if not all physical and verbal

prompts. After student data stabilized during the first intervention phase, the beat-the-clack game was continued with another 25% reduction in time limit. The second intervention phase criterion was then 10 minutes; this indicated that in order to earn a mystery surprise, the target child would have to get dressed in 10 minutes or less. Once the child met the new criterion for five consecutive days, the criterion was reduced once again by 25% to seven minutes. After the child met the new criterion for three consecutive days, the beat-the-clock game was removed and baseline conditions were reinstated. During this time, all game-related materials were removed and the child was told that she would not be playing the game that week. After four days of the second baseline, a final intervention phase with a time criterion of five minutes was reintroduced. Immediately after this final intervention session, a short social acceptability survey was administered orally to the child. Basically, she was asked to describe her reactions to the intervention. More specifically, the child was asked to comment on the importance of intervention goals (e.g., how important is it to get dressed quickly in the morning: how important is it to get dressed without mom's help?); (b) acceptability of intervention procedures (e.g., how much did you like trying to beat the clock? How much did you like getting fewer reminders from mom? How much did you like earning mystery surprises?); and (c) satisfaction with outcomes (e.g., how much did the beat-the-clock game help you to get dressed faster and without mom's help?). Two follow-up probes were conducted one week and two weeks after the intervention was removed.

Results

The effects of the beat-the-clock game on the amount of time that it took the target child to get dressed can be seen in Figure 1. During initial baseline sessions, it took an average of 17 minutes for her to get dressed. When the first intervention phase (i.e., criterion = 13 minutes) was

introduced, there was an immediate decrease in required dressing time to an average of 10 minutes. This represented about a 41% decrease in dressing time from initial baseline. Data showed as well that the child met the criterion on four out of five (80%) intervention sessions. When the criterion was decreased once again by 25% (i.e., criterion = 10 minutes), the child's dressing time dropped as well to a mean of five minutes, or the equivalent of a 50% reduction in dressing time. It is significant to note as well that the child's dressing time was well below the established criterion during all five intervention sessions. As noted, when the criterion was decreased once more by 25% (i.e., criterion = 7 minutes), the child also reduced her average dressing time to three minutes or the equivalent of a 40% reduction over the previous intervention phase. During the withdrawal of treatment phase, the child's dressing time began to increase once again. Her overall dressing time increased to a mean of 12 minutes with a range of nine to 15 minutes. While these data were an improvement over initial baseline times, they represented a *reversal* in data patterns as predicted. During the final intervention phase, the dressing criterion was set at five minutes. Data showed that (a) it took an average of three minutes for the target student to get dressed; (b) she beat-the-clock during all three sessions; and (c) there were no overlapping data points with the adjacent baseline phase. Over the course of the investigation, the target child met or beat the dressing time criterion during 15 of 16 sessions or about 94% of the time. During a one- and two-week follow up sessions, where the game was not in effect, dressing times increased to four and 12 minutes respectively. This represented an increase from the final intervention time, but was still much lower than during initial baseline levels.

The effects of the beat-the-clock game on the number of dressing prompts can be seen in Figure 2. As shown, during initial baseline the target student's performance was fairly stable

with an average of 10.4 prompts (i.e., range = 9 to 13) given to get dressed in the morning. When the first phase of the beat-the-clock game was introduced, the mean number of required prompts dropped to five. This represented a 52% decrease in prompts given and there were no overlapping data points between baseline and the first intervention phase. Once pupil data stabilized, the time criterion was dropped once again to 10 minutes. During these five sessions, the target child only needed an average of 1.4 prompts to get dressed independently (range = 0 to 3). There were two overlapping data points between the first two intervention phases. When the time criterion was changed once more to seven minutes, the target child decreased her mean prompt level to 0.67 (range = 0 to 1) or the equivalent of less than one prompt per session. Withdrawal of the beat-the-clock game resulted in an increase in prompts to a mean of 9.6 (range = 4 to 12 prompts). These data trends were reversed again, when the final intervention phase was introduced (i.e., criterion = 5 minutes). On average, .33 prompts were required to get the child to dress independently. During follow-up week one showed three prompts for an average of .75 prompts per minute, and week two was six prompts for an average of .5 prompts per minute. While these data are lower than in baseline, they did increase from week one to two, showing a trend toward returning to baseline conditions.

Discussion

The present results suggest that the beat-the-clock game was quite effective in reducing both dressing time and required prompts. A typical dressing session went from taking an average of 17 minutes with 11 reminders to a mean of 3.8 minutes and less than one prompt (i.e., .33). Moreover, each time the time criterion was changed (i.e., decreased or increased), the child's behavior followed in a predictable fashion. This suggests that the beat-the-clock game and not some extraneous variables (e.g., history, maturation, or testing effects) were responsible for the

behavior change. Moreover, the child met established criteria during all but one intervention session. As such, she earned numerous mystery surprises over the course of the investigation. These findings are consistent with previous research on both time limit reductions (e.g., Ayllon et al., 1976; Drabman et al., 1981; Drabman & Wurtele, 1984; Tiger et al., 2007) and the use of mystery motivators with younger children (e.g., Murphy et al., 2007; Robinson & Sheridan, 2000). The present findings extend the literature on daily timings, time limit reductions, and mystery motivators to a new geographic location, target student, setting, and outcome measures. It is also important to note that although only time limits were reduced, there were concurrent decreases in required prompts. This occurred even though prompts were not targeted explicitly. This suggests that it may be possible to change multiple target behaviors without formal criteria being established for each target behavior. This should add to the efficiency of the intervention for other parents and care-takers.

Aside from the objective data, it became quite clear that things got better in the morning with the beat-the-clock game. Stress levels decreased substantially and parent-child interactions were quieter and less harsh. The extra morning time also allowed family members to be on time for daily duties which, in turn, reduced stress even further. During social validity assessments, all family members reported less stress in the morning and throughout the day. They also felt that the intervention was easy to implement and that data collection was not a problem, although inter-rater reliability checks were a bit challenging. In particular, parents often missed one another's prompts. They did agree, however, to continue using the intervention but selected a kitchen timer rather than the computer as the timing device. The target child said that the beat-the-clock game was a lot of fun and her favorite part was coloring the magic squares to find Xs and get surprises. She also said that it was good to get dressed quickly because it made momma

happy and that she would play the game even if there were no prizes; although she did stress that prizes *are* better because "kids like them". The amount of money spent on surprises was miniscule in comparison to the stress and anxiety that accompanied baseline sessions. All family members felt that the beat-the-clock game was a success and they were satisfied with the outcomes.

The present investigation is important because it provides a rather simple yet powerful intervention that parents or other care-takers can use to improve young children's behavior. In this case, the target was quick, accurate, and independent dressing with a minimum of reminders. The child's behavior changed immediately and noticeably each time the criterion was changed thereby suggesting a functional relationship between the game and the child's dressing behavior. Given that major components of this intervention (e.g., daily timings, time limit reductions, and mystery motivators) have been used effectively with other target behaviors (e.g., reducing negative parent-child interactions, staying in bed at night, and excessive dawdling), it is reasonable to assume that the game may be useful for improving other self-help skills. The study is also noteworthy in that it was implemented exclusively by the parents and in their natural living arrangement. Although the mother was a graduate student in education, intervention procedures were relatively simple enough for most, if not all, parents and care-takers to implement with a high degree of accuracy.

While present findings indicate that the beat-the-clock game was an effective intervention for this child, it is less clear which components of the package contributed most to the behavior change. Were the mystery surprises primarily responsible for improved independent dressing or was it the challenge of beating-the-clock that produced the quick, accurate, and unprompted dressing? What roles, if any, did feedback and behavioral momentum play in the behavior

change? These questions can only be addressed through future research. In particular, component analysis studies would be quite useful (Kennedy, 2005). Here, separate components would be implemented and withdrawn from the package and subsequent effects on child performance would be analyzed. Researchers might, for instance, remove the mystery surprises but continue daily timings with feedback or simply use mystery motivators without time limit reductions. Additional research might also examine the effects of inter-rater reliability checks on the use of this intervention. This was reportedly the only challenging part of the study. Do the benefits of ensuring accurate and reliable data collection outweigh the costs associated with collecting these data in naturalistic settings?

Although current findings are promising, there are some important study limitations to consider when interpreting results. First, the study was conducted with only one child, in one setting, and only one albeit important target behavior. As such, generalizations to ages, settings, and target behaviors are not warranted at this time. Second, the study was conducted for a relatively short duration (3 to 4 weeks) and no generalization data were collected. It is not appropriate to conclude, therefore, that the same effects would be obtained over a longer time period and/or that benefits would generalize to other self-help skills. It is also not clear whether or not treatment effects will be maintained if and when intervention components are faded. Future research, therefore, should include longer intervention durations and more explicit generalization measures for examining potential "spillover effects". Current findings are also limited to some extent by the fact that the investigator was also the primary data collector and parent. Although procedures were used to monitor fidelity of implementation (i.e., fidelity assessments), one cannot rule out potential experimenter bias effects at this time. Future research should utilize independently trained data collectors to the maximum extent possible.

Finally, future research might want to examine the effects of the beat-the-clock game on siblings' behavior. For example, are there any negative side-effects of not being the target for intervention? This did not appear to be the case here because the sibling voiced clear support for the game. However, it may be one factor to consider in future investigations. Further research should also consider systematically reducing the density of frequency of rewards to see what effects, if any, that has on children's behavior.

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Figure 1shows the number of minutes required to dress independently across conditions.

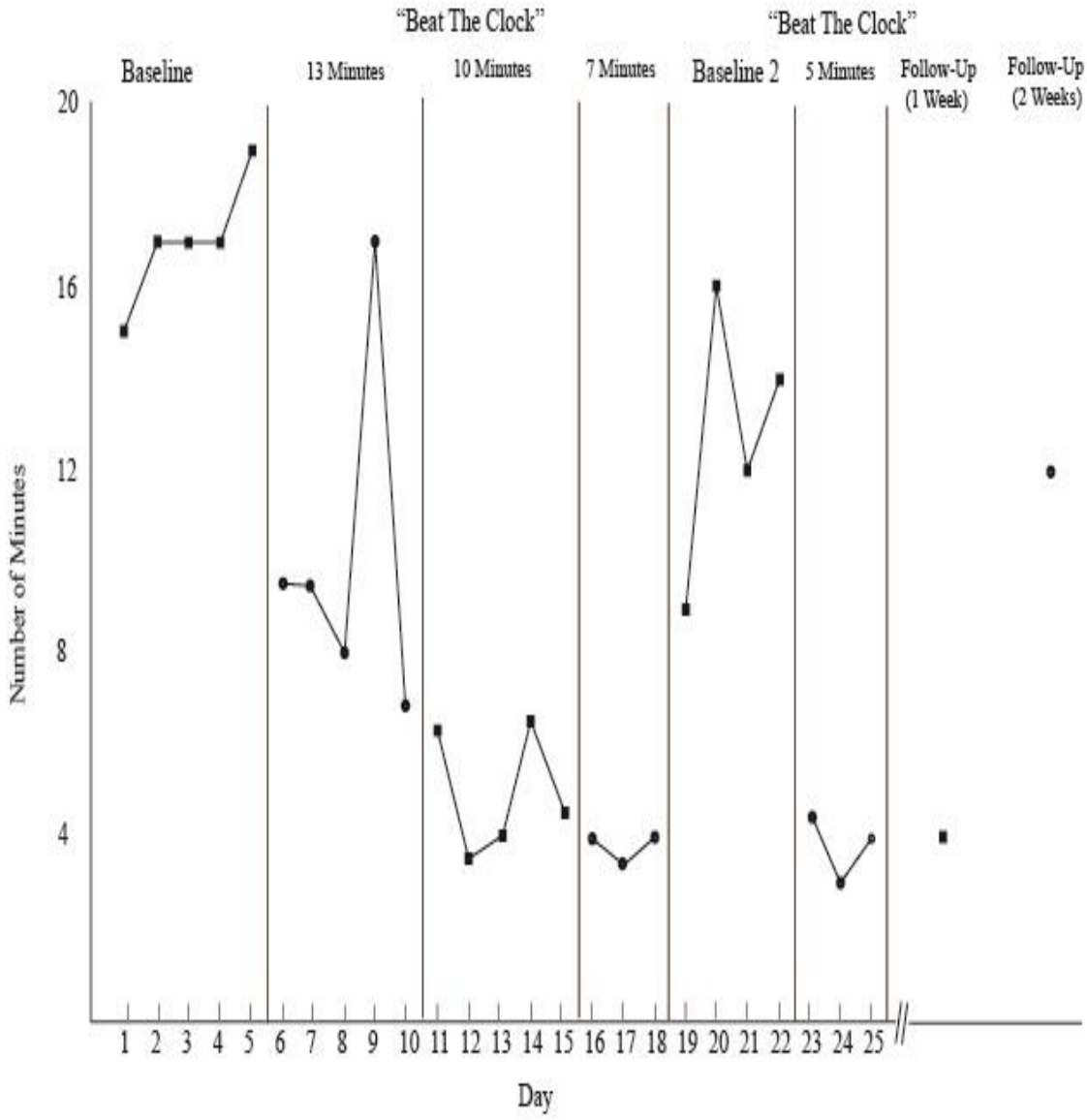
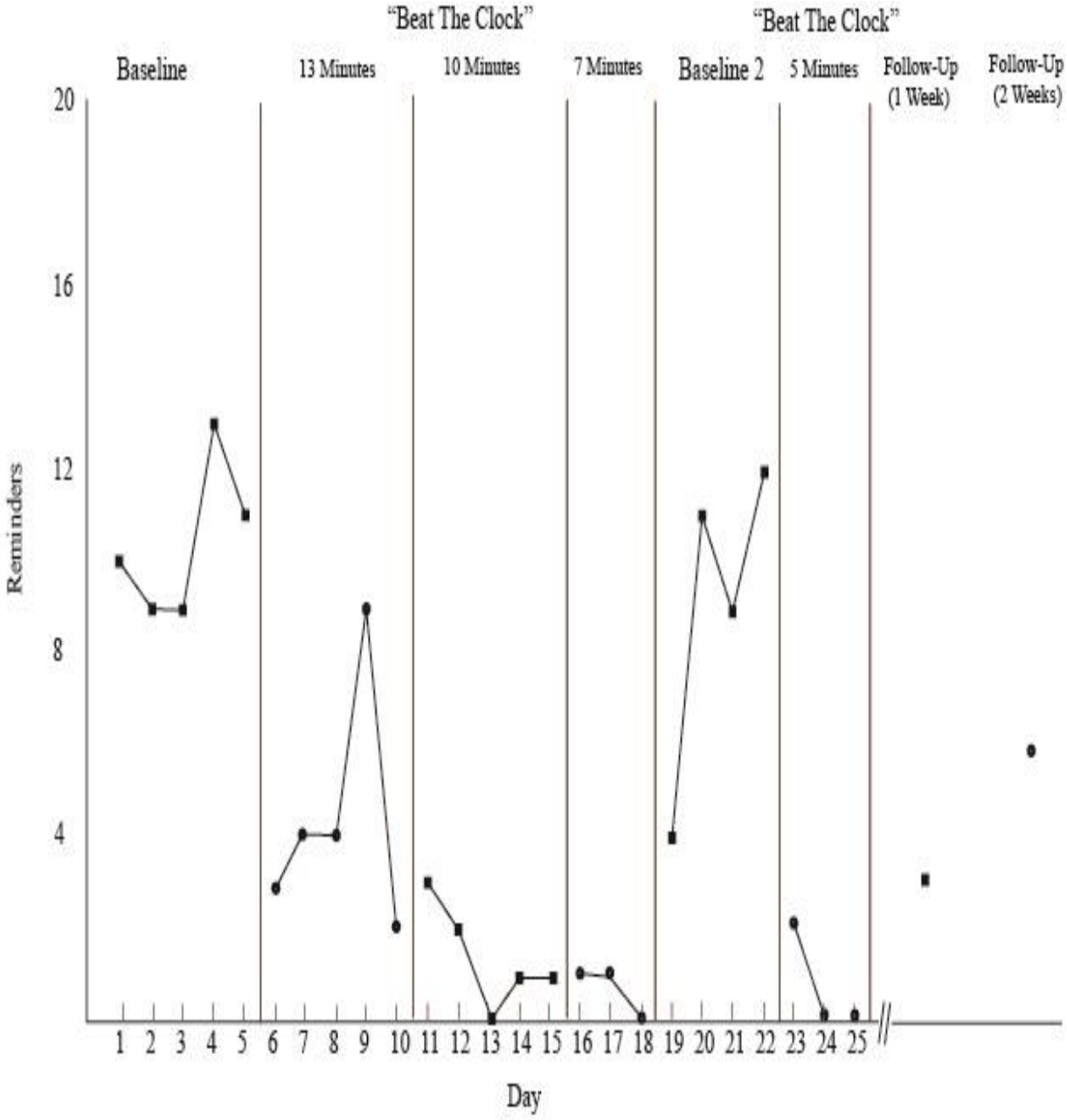


Figure 2 shows the number of reminders given during dressing across conditions.



Appendix A

Data Collection Sheet

Session #	Start Time	End time	Prompts
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

APPENDIX B

Procedural Fidelity Checklist

Beat-the-Clock Game

Investigator: _____ Date: _____

Observer: _____

Time session began: _____ Time session ended: _____

Directions: Observe the investigator as s/he implements the intervention and use the scoring code below to note the presence and/or absence of each tutoring component.

Scoring Code: + Behavior demonstrated

\- Behavior not demonstrated

NA Not applicable

General Implementation

_____ 1. Investigator lays out child's clothing on the couch.

_____ 2. Investigator sets timer for appropriate criterion and reminds child that if she beats the timer, she can color a square.

_____ 3. Child is prompted to begin by investigator saying, "on your mark, get set, GO!" The stop watch is started at Go.

_____ 4. Investigator observes child from near-by.

_____ 5. Investigator records tally marks for each verbal and/or physical prompt delivered to child.

_____ 6. Child dresses herself and only receives assistance for "stuck" body parts and fastening zippers and difficult buttons.

_____7. Once child is dressed appropriately (except for shoes), timer is stopped and time is recorded.

_____ 8. If child beats the timer, she colors in a square on chart.

_____ 9. Chart is displayed prominently and has X's hidden in random squares.

_____ 10. Child chooses square to color; if X appears, a prize is drawn from bag.

_____ 11. If child does not beat timer, she is told to try harder and does not color a square.

Total _____/11 (Please record the number of behaviors observed plus the number of NA)

_____ % Procedural fidelity

Anecdotal Comments:_____
_____
_____
_____

Appendix C

Social validity survey to be delivered orally to child

1) How much did you like playing the beat the timer game?
2) How much did you like coloring the squares to find the X's?
3) Is it a good thing to get dressed quickly without mom's help?
4) What was your favorite part of playing the beat the timer game?
5) Did getting the prizes make the game more fun?
6) Would you have liked it as much if there were no prizes?

Social Validity survey delivered orally to other family members

1) How easy was the intervention to implement?
2) Were there any problems in implementation and/or data collection?
3) Did the intervention change the stress levels of your morning routine?
4) Did these changes in stress level affect you in other parts of your day?
5) Will you continue to use the timer and prize system in your morning routine with the child?
6) Overall, how effective do you think the intervention was at decreasing the time required for the child's morning dressing?