THE EFFECTS OF BEHAVIORAL-OBSERVATION TRAINING ON CORRECT IMPLEMENTATION OF GUIDED COMPLIANCE AND CHORE COMPLIANCE IN CHILDREN WITH DEVELOPMENTAL DISABILITIES

by

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Abstract

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Child noncompliance with caregiver requests is a problem for children with and without disabilities. Caregivers would benefit from learning effective procedures for increasing compliance. The purpose of this study was to evaluate a procedure that involved training three caregivers to observe and score video models, in order to learn to use a least-to-most prompting procedure (LTMPP) to teach their children to complete two chores. In instructions-only training, a trainer gave caregivers written instructions on how to implement the LTMPP. In behavioral-observation training, a trainer taught caregivers to observe and score the behavior of a video model demonstrating a LTMPP. After each form of training, the caregivers practiced using the LTMPP to teach their child to complete chores. Following behavioral-observation training, two of three caregivers increased correct use of the LTMPP and the children in both of these dyads demonstrated increased compliance relative to instruction-only training. For the third dyad, behavioral-observation training alone did not increase caregiver correct use of the LTMPP to mastery. For this dyad, remedial feedback increased caregiver correct use of the LTMPP and child compliance. A systematic demonstration of behavior change across all three caregivers did not occur resulting in a loss of experimental control, demonstrating that

behavioral-observation training was effective for some but not all caregivers. Social validity measures indicated that caregivers found the need to increase chore compliance to be acceptable, the procedure to be acceptable, and effective.

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Noncompliance in a child is defined as failure to follow a request made by a parent (Forehand, 1977). Forehand conducted a review of 12 articles that examined child noncompliance in an attempt to determine compliance norms and found that, typically developing children were compliant for 60% to 80% of parental requests and suggested that children who were compliant for less than 60% of requests be considered "clinically noncompliant." Forehand described this conclusion as being consistent across a range of settings and definitions of compliance.

Noncompliance can relate to any parental request. A common example is the request to perform a household chore. White and Brinkerhoff (1981) surveyed 790 families, each having at least one child under the age of 18 years. They found that 91% of 5-to 9-year-old boys engage in typical household chores, that is, tasks other than schoolwork that relate to everyday household matters. The children spent a weekly median of 2.3 hours completing these chores. The percentage of children who performed and time spent engaged in those chores increased with age. Typically, children's earliest chores related to their own daily living, such as cleaning up after themselves and making their beds. As children age, they learn chores that benefit the household, such as setting the table, yard work, and laundry. Parents reported teaching chores to teach responsibility, build character, and help children learn to be a contributing part of the

family. White and Brinkerhoff (1981) found that 75% of parents surveyed reported that they believed completing daily chores benefits the child. Caregivers of typically developing children report teaching chores to benefit their child and their household. Children with developmental disabilities could also benefit from learning to complete chores in the same ways that typically developing children benefit. Thus, teaching children with developmental disabilities to complete household chores is socially valid.

Determining consequential factors associated with compliance may lead to a better understanding of this behavior. Wilder, Harris, Reagan, and Rasey (2007) evaluated the function of noncompliant behavior in two typically developing preschool children by conducting a functional analysis. Teachers instructed the children to pick up and put away some toys after playing with them. The researchers evaluated the function of noncompliance in three conditions: (1) preferred activity, (2) non-preferred activity, and (3) a control condition. In each condition, a 2-min pre-instruction period was followed by the experimenter delivering and instruction to the child, followed by a 3-min post-instruction period. This was done to determine if the activities that the children engaged in during the pre-instruction period affected compliance. In the preferred activity condition, the children watched a preferred video. The instruction was to turn off the video. In the non-preferred activity condition, non-preferred items were available in the pre-instruction period. The instruction was to pick up papers that were on the floor. In the control condition, children were given access to low preference items in the pre-instruction period and the instruction was to turn on a preferred video. Both children were likely to be noncompliant during preferred activities in the pre-instruction period, with one child demonstrating 88% noncompliance and the other 63% noncompliance in this

condition. Thus, child compliance was determined by the desirability of the activity the children were engaged in prior to the instruction being delivered as well as the desirability of the activity the children were asked to comply with. Specifically, compliance was less likely when the children were asked to terminate a desirable activity, in order to comply with an instruction that involved engaging in a task with a lower desirability value.

One method behavior analysts use to teach children with autism to comply with demands is the least-to-most prompting procedure (LTMPP) (Miltenberger, 2008), which typically involves the presentation of gradually more intrusive prompts until the child emits the correct response. This has also been called three-step prompting (Tarbox, Wallace, Penrod, & Tarbox, 2007) or, when physical prompts are used, guided compliance (Miles & Wilder, 2009).

Research on training caregivers to use the LTMPP to teach children to do chores shows that in all cases, caregivers learn to use the LTMPP. For example, Tarbox et al. (2007) trained caregivers of three children to use the LTMPP to teach their children with various diagnoses to perform ten tasks for which the children typically demonstrated low levels of compliance. Caregivers received behavioral skills training (BST) including instructions, modeling (with role-play), rehearsal (with role-play), and feedback. Caregivers learned to use the LTMPP and as a result, caregivers decreased the number of prompts used to produce child compliance after receiving training. All children showed increases in compliance. For Child 1, compliance increased from 40% in baseline to 85% after caregiver training (averaged across two teachers and one teacher assistant). For Child 2, compliance increased from 51% in baseline to 74% after caregiver training. For

Child 3, compliance increased from 17% in baseline to 64% after caregiver training. Child compliance also generalized to novel demands presented at follow-up. In this instance, then, caregiver training effectively changed the behavior of both the caregiver and the child. The training procedure in total, however, required "a few hours" (Wallace, personal communication, April 28, 2011). Thus, despite the effectiveness of this procedure, the cost of training caregivers individually may be prohibitively expensive, preventing this form of caregiver training from becoming a viable practice. If an effective and efficient model for caregiver training were available, it could substantially improve the viability of training caregivers in LTMPPs, and in turn increase compliance levels among children.

While increases in the use of LTMPPs frequently occur in the caregiver literature, accompanying increases in child compliance do not always occur. Miles and Wilder (2009) trained three caregivers of children with and without autism to use a LTMPP to teach three children to each perform one chore. The dyads were a kindergarten teacher with a 6-year-old boy with autism, a nanny with a 6-year-old girl with an unspecified learning disability, and a mother with her typically developing 4-year-old boy. The researchers used BST that included instructions, modeling, rehearsal (in vivo), and feedback (graphic and verbal). Training required an average of 59 min (ranging from 40 min to 75 min) to reach the mastery criterion of 100% accuracy across three consecutive trials. Caregivers 1, 2, and 3 demonstrated increases in the correct use of the LTMPP from 38% in baseline to 99% post training, from 36% in baseline to 98% post training, and from 29% in baseline to 97% post training, respectively. Child compliance, however, only increased for two children (from 39% in baseline to 50% post training for Child 1

and from 45% in baseline to 63% post-training for Child 2), and decreased slightly for Child 3 (from 37% in baseline to 35% post training). Thus, although the researchers effectively taught caregivers to use the LTMPP, child compliance only increased for two out of three children. It is important to note that following caregiver training, two of the three children still met Forehand's (1977) criteria for clinical noncompliance.

Wilder and Atwell (2006) evaluated a guided compliance procedure used to increase compliance with 1-step directions in typically developing preschool children. If a child complied with a verbal instruction, the therapist delivered brief praise. If a child did not comply, the therapist delivered the verbal instruction paired with a modeling prompt. If the child still did not comply, the therapist delivered the verbal instruction paired with a physical prompt that necessarily produced the correct response. The procedure was effective at increasing compliance in four out of six children, raising compliance from 0-22% in baseline to 70-87% during the guided compliance phase. Guided compliance was either ineffective or produced compliance that was not maintained for the remaining two children. Therefore, as in Miles and Wilder (2009), the procedure did not reliably increase compliance in all children. This research demonstrated that challenges in training caregivers in the LTMPP include the cost of the training, and effectiveness at increasing child compliance reliably.

Wilder and Atwell (2006) attribute the efficacy of guided compliance to three possible consequence-based factors. First, guided compliance may work through escape extinction. Specifically, if a child engaged in noncompliant behavior to escape completing a chore, the physical prompts prevented that escape. Thus, when using a LTMPP, escape maintained noncompliance was reduced through escape extinction.

Second, the physical guidance component may have functioned as a positive punisher for noncompliance. If a child finds the physical prompt component of a LTMPP aversive, and the physical prompt only occurs following noncompliance, reduction of noncompliant behavior may occur through positive punishment. Third, compliance may have increased due to negative reinforcement. Some components of the LTMPP may have been aversive to a child. Compliance following a modeling prompt results in escape of the remaining prompts in the LTMPP. Compliance following a caregiver's instruction to complete a task, results in avoidance of the LTMPP altogether. Thus, compliance may increase through negative reinforcement.

It is possible, however, that these consequences alone were not sufficient to increase child compliance. Antecedent manipulations, other consequence-based manipulations, or a combination of antecedent and consequence-based manipulations may also be required to increase child compliance.

Researchers typically use BST to train caregivers to use the LTMPP, but this form of training requires one-on-one training with a skilled trainer, which may not be readily available to all caregivers and may be time-consuming and costly when it is available. One solution to this problem, that does not require the one-on-one training involved in BST, is training that employs observational learning techniques. The organizational behavior modification (OBM) literature has shown that observing and scoring other people’s behavior often improves the same behavior in the observer, a phenomenon known as the observer effect (Alvero & Austin, 2004). For example, Sasson and Austin (2005) evaluated the observer effect with eleven computer operators in a large hospital. They first measured the ergonomically safe behavior of these computer operators as they

worked at their computers. The researchers divided the operators into control and observation groups. After completion of their work, all participants received written numerical feedback that described their percentage of safe behavior for each ergonomic response, and a written description of each ergonomic response. During intervention, the participant observer and experimenter engaged in a joint observation of a co-worker for 5-min, during which they observed and scored the behavior of a non-observer participant. Next, the experimenter observed the participant observer engaging in similar office behavior. Approximately four hours later, the experimenter conducted a second observation of the participant observer. The researchers compared the effect size of each participant in each condition to their own baseline as a measure of behavior change. Cohen's *d* is an estimate of the difference between two means expressed in standard deviation units. Using Cohen's (1988) qualitative labels of effect size, the observer participant's effect size in the observation condition (*d*= 1.98, large effect size). The effect size of the observer (*d*= 0.85, large effect size), and non-observer was (*d*= 0.76, medium effect size). Thus, observing and scoring the behavior of a co-worker increased the safe behavior of the participant observer relative to the non-participant observer. This study demonstrated the efficacy of observational learning in an applied setting, raising the possibility that it might be extended successfully to other applied settings such as caregiver training.

An additional consideration in observational learning is the relationship between the accuracy of the observers' scorings and their subsequent safe behavior. The above researchers conducted a Pearson correlation coefficient (*r)* and found no correlation between these factors for three out of six participants (*r*= -.09, *ns. r*= .07, *ns. r*= .06, *ns.*

for participants 2, 6, and 8, respectively) and a high-to-medium positive correlation in three out of six participants (r=-.92, r=.70, r=.44 for participants 10, 9, and 5, respectively) (Sasson & Austin, 2005). Similarly, Sasson, Austin, and Alvero (2007) found a positive correlation of these factors for only two of six participants, while Alvero, Rost, and Austin (2008) found no correlation for any of their six participants. In summary, of the 18 participants for whom correlations were calculated, in the three experiments above, only five demonstrated a correlation. This indicates that the accuracy with which an observer scores an observation does not play a role in subsequent performance.

To summarize, noncompliance is an important, socially valid concern for caregivers of children with developmental disabilities. To date, researchers have shown uniform success in training caregivers in LTMPP, but this has not always translated into increased compliance in children. Moreover, the individual training for a caregiver in LTMPP may be prohibitively costly, time-consuming, or simply unavailable. The OBM literature on the observer effect suggests that observing and scoring other caregivers' behavior might prove to be an effective alternative approach to providing LTMPP training. To date, no research has evaluated the observer effect's utility in caregiver training, specifically teaching caregivers to use the LTMPP. Thus, the current study evaluated the utility of the observer effect in caregiver training by using the observation and scoring methods of Sasson and Austin (2005) to train caregivers of children with autism to use an LTMPP (Miles & Wilder, 2009) to teach their children to do daily chores.

Method

Participants and Setting

The researchers recruited participants through an advertisement to a social group for caregivers of children with developmental disabilities (see Appendix A). The participants were three caregiver-child dyads that met the following criteria: (1) the child was diagnosed with autism, Asperger syndrome, or pervasive developmental disorder not otherwise specified (PDD-NOS) (diagnoses were reported by caregivers, children were not diagnosed specifically for this experiment); (2) the child was between the ages of 4 and 15 years; (3) the child displayed at least 50% noncompliance when asked to complete the chores selected in pre-baseline chore selection, described below; and (4) caregivers were able to read English and were available at least two days per week for six months.

Three caregiver/child dyads participated. A fourth dyad was excluded from this study. This caregiver demonstrated mastery of the LTMPP in the instructions-only training condition. The child also mastered four chores in the instructions-only training condition, indicating further training was not necessary. Dyad A consisted of Mary, a 31-year-old mother employed in sales, and John, a 6-year-old boy diagnosed with PDDNOS and Attention Deficit Hyperactivity Disorder (ADHD) by a psychologist and neurologist (as reported by his mother) using the *Vineland Adaptive Behavior Scale* (Sparrow, Balla, & Cicchetti, 2005) and other measures. John was educated in a self-contained classroom that contained 6 children. Dyad B consisted of Kathleen, a 33-year-old mother employed in a government agency, and Jeff, an 8-year-old boy diagnosed with Autism by a neurologist (as reported by his mother) using a variety of assessments and observations. Jeff was educated in an inclusion classroom. Dyad C consisted of

Susan, a 44-year-old mother employed in marketing operations, and Brad, a 6-year-old boy diagnosed with PDDNOS by a child psychologist (as reported by his mother) using the *Autism Diagnostic Observation Schedule* (ADOS) (Lord et al. 1989). Brad was educated in a self-contained classroom that contained 12 children. All sessions took place in the children's homes. For Dyad A, caregiver training and testing took place in the family's living room in their apartment. For Dyad B, caregiver training took place in the living room of their house and testing took place in the child's bedroom or in the living room. For Dyad C, caregiver training took place in the dining room and testing took place in living room or bathroom of their apartment. All training was provided by the first author, who is a doctoral student and Board Certified Behavior Analyst, who had worked with families of children with developmental disabilities for 8 years. For the duration of this experiment the first author will be described as the "trainer" and research assistants who helped with data collection and analysis will be referred to as "researchers."

Materials

The trainer recorded all training videos and all caregiver training sessions on a FLIP© video camera manufactured by Pure Digital Technologies, Inc. He played the training videos on an ACER Aspire One© laptop with a 25.6 cm screen.

Procedure

Chore Selection

Two weeks prior to the instructions-only training condition, the trainer asked each caregiver to produce a list of five chores that her child was able to complete, but was often noncompliant when asked to do so. Then the trainer asked each caregiver to have her child complete each chore on the list five times. If the child started or completed the

chore within the first three minutes of the caregiver's request, the chore was not used for this experiment. If the child did not start the chore within three minutes, the trainer considered that chore. The trainer placed chores for which the child demonstrated less than 50% compliance on a list called "acceptable chores." The trainer asked the caregivers to rank the acceptable chores by importance. The trainer designated the first chore ranked by the caregiver as the target chore and the second chore ranked by the caregiver as the probe chore.

The trainer used www.Random.org to create 50 sets of three integers. Each set contained the integers 0, 1 and 2 in a random order. Next, the sets were cut and pasted from www.Random.org into an Excel spreadsheet. Using the find and replace function, the integer 0 was replaced with the word *probe,* the integer 1 and 2 were replaced with the word *target.* The result was a table of 50 sets of the words *target* and *probe*, where the word target appeared twice per set and the word probe appeared once per set. Using this table, the order of target and probe chores was predetermined. Caregivers attempted the target chore twice and the probe chore once per block of three sessions.

Design

The current study used a nonconcurrent multiple baseline design across parent/child dyads.

General Procedure

All caregivers experienced at least two forms of training: (1) instructions-only training as a baseline phase, and (2) behavioral-observation training as a treatment phase. Mastery criterion was 90% across two consecutive sessions. If the caregiver did not reach mastery criterion in the behavioral-observation training condition, feedback was provided

as a remedial treatment only for Dyad C. After instructions-only training, or behavioral-observation training the caregiver attempted to use the LTMPP to teach her child to complete a chore in a testing trial. Each session consisted of five cycles of training and testing.

Dyad A experienced two sessions per week, for four months. Dyad B experienced three sessions per week, for three months and Dyad C experienced three sessions per week, for five months. Schedules were adjusted to accommodate canceled sessions due to illness, preexisting schedule conflicts, holidays and vacations.

Instructions-only Training

In each instructions-only training session, the trainer gave the caregiver written instructions on how to perform the LTMPP (see Appendix B) and asked her to read them. Then the trainer read the instructions aloud. If the caregiver had any questions, the trainer answered them by referring to the pertinent part of the instructions. For example if the caregiver asked “What do I do if he does not start the chore,” the trainer said “Let’s look at step 5: if the response did not occur, do not praise. Go to step 6.” Next, the trainer asked the caregiver to have her child complete a chore by saying “Okay, let’s start.” Training and an attempt to complete the chore occurred five times in each session. Caregivers who demonstrated mastery of the LTMPP (90% or better across two consecutive sessions) in this phase were excluded from the study.

Behavioral-observation Training

At each behavioral-observation training session, the caregiver observed a training video (described below) while scoring correct and incorrect responses made by the video model onto a caregiver scoring checklist that contained a list of the steps in the LTMPP

in the correct order, with a place to score each step. Appendix C shows a score sheet filled out by the caregiver in Dyad A. There were three scoring options for each step of the LTMPP: correct, incorrect, and not applicable. The trainer instructed the caregiver to score a step as correct if the caregiver model engaged in the correct response at the correct time, incorrect if the caregiver model omitted a response, and not applicable if that step was not required. For example, as shown in Appendix C, the caregiver in Dyad A observed video #20 in the first trial of session 10. Her scoring indicated that the video model completed steps (1, 3, 5, 6, 9, and 10), did not complete steps (2, 7, and 8), and that steps (4, 12-16) were not applicable.

Before the first training video only, the trainer scored a sample training video while the caregiver watched. At each step of the LTMPP, the trainer told the caregiver what he scored on his checklist and why. No additional feedback was given to the caregiver. Behavioral-observation training ended when the caregiver demonstrated 90% or higher performance of the LTMPP across two consecutive sessions.

Feedback

If the caregiver did not reach the mastery criterion during behavioral-observation training, the trainer added a third remedial phase. In this phase, the caregiver attempted to have her child complete a chore. Immediately after the attempt, the trainer provided verbal feedback to the caregiver. The feedback described correct and incorrect responses made by the caregiver. For example, the trainer might have said “Next time, be sure to wait at least three seconds after you request the chore before speaking to your child” or “The way that you physically prompted was correct that time.” This condition continued until the caregiver was 90% correct in using the LTMPP.

Training Videos

Each of the 23 training videos showed a mother (caregiver model) using the 16-step LTMPP in one trial to teach her 9-year-old typically developing daughter (child model) how to complete a chore. The content of each video varied in terms of (1) the chore demonstrated; (2) whether the child model was compliant; (3) the prompt level required for the child model to complete the chore; (4) duration (17–128 s); and (5) the percent correct use of the LTMPP by the caregiver model (range = 50-100%). For example, one training video may have shown the caregiver model using a verbal instruction and model prompt with 80% accuracy to teach the child model to put away a train set. Another video showed the caregiver model using a verbal instruction with 100% accuracy to teach the child model the same chore.

The details of each training video are described in Table 1. The content of the videos was based on multiple exemplar training, in that, each video varies on at least one of the five variables described above. Table 1 shows the chore demonstrated in each video, the prompt level that the caregiver model used, the caregiver model's accuracy at using the LTMPP, and whether the child was compliant, for each training video. The training videos for each chore showed at least one example of each prompt level, and at least one video that demonstrated 100% correct caregiver responding.

In order to show a variety of models, there were multiple videos for each chore. Clean up toys, make bed and dressing each had six training videos and wash hands had five training videos. To randomize the presentation order of the training videos, the trainer assigned a number to each video. The trainer used Random.org to generated 50 random sets that arranged these numbers in blocks of five. The trainer used a new

randomized block of five videos during each behavioral-observation training session. Appendix D shows the randomized order of the training videos.

Testing Trials

A testing trial started when the trainer told the caregiver to have her child complete the target chore using the LTMPP. It ended in one of two ways: (1) when the child completed the chore following a verbal instruction, model prompt, or physical prompt, or (2) after five minutes of noncompliance. Noncompliance was defined as the child engaging in any behavior other than completing the requested chore. If the child was noncompliant for five minutes, the trainer said, "Time's up. Let's take a five minute break," and discontinued that testing trial. This was done to minimize the occurrence of problem behavior and child distress. After a five minute break, a new training and testing trial started. The trainer conducted a total of five training and testing trials in each session.

Dependent Measures

The trainer collected data on six measures: (1) caregiver accuracy in performing the LTMPP, (2) caregiver accuracy in scoring video models, (3) the number and types of prompts delivered by caregivers each session, (4) the duration of each session, (5) child compliance, and (6) child maladaptive behavior. The standards and methods for measuring each of these measures were as follows.

Definitions

(1) Caregiver accuracy at performing the LTMPP. After each session, the trainer assessed the caregiver's accuracy using the same checklist and scoring method described in the training video section above. The trainer scored video recordings of each

caregiver's attempt at using the LTMPP for each trial in a session. For each step of the LTMPP, the trainer scored one of the following options: "1" if a step was completed correctly, "0" if a step was omitted or otherwise not completed correctly, and "NA" if a step was not applicable.

(2) Caregiver accuracy in observation and scoring. The researchers calculated the caregiver's observation and scoring accuracy by using IOA data on the checklists filled out by the caregiver during behavioral-observation training and a template checklist that had been scored previously by the trainer for each training video. Disagreements between the caregiver and the trainer were assumed to be incorrect responses made by the caregiver and reflected an overall accuracy measure of the caregiver's ability to accurately score the video model.

(3) The number and level of prompts delivered by caregivers. The number of prompts was measured in the following way. The trainer counted the number of trials in each session where the child completed a chore following the caregiver's instructions without requiring a prompt. In this situation, the trainer counted zero prompts. If the child required only a modeling prompt to complete the chore, the trainer counted one prompt. If the child did not respond to the modeling prompt and a physical prompt was required for the child to complete the chore, the trainer counted two prompts. The number of prompts refers to the sum of prompts delivered by a caregiver, for all trials, in a session. The level of prompts refers to the type of prompts that were required for the caregiver to have her child complete a chore.

(4) Session Duration. The duration of each trial was measured from when the caregiver called her child by name, until the chore was completed, using the video

recordings from each session. When the caregiver called her child's name the time marker on the video recording was noted, when the chore was complete the time marker on the recorded session was noted again. The difference in time between the first and second notation was recorded as the session duration.

(5) Child compliance. The trainer defined child compliance as the child starting the chore within 10 s following the first verbal instruction, or completing the chore without requiring a model or physical prompt. The trainer scored a child as noncompliant if the model prompt or physical prompt were required to complete the chore.

(6) Child maladaptive behavior. During the testing trials, the children sometimes engaged in problem behavior. Child A presented three maladaptive behaviors when asked to complete a chore. These were (1) screaming, defined as a punctuated vocal utterance following a demand, (2) grabbing, defined as making contact with his mother's hair, clothing or body with his hands, and (3) off-task behavior, defined as the child engaging in an activity such as playing with a toy or other item after the caregiver instructed the child to complete a chore. Child B also presented three maladaptive behaviors: (1) saying "No," (2) whining, defined as the child vocally protesting the demand or requesting a different activity, and (3) off-task behavior, as defined above. Child C presented the following three maladaptive behaviors: (1) saying "No," (2) asking for help, defined as asking the caregiver to complete the chore or part of the chore for him, and (3) whining, as defined above.

Measures

(1) Caregiver accuracy at performing the LTMPP. For each testing trial, the trainer calculated a percent correct measure by dividing the number of correctly

completed steps of the LTMPP by the total number of steps required to have the child complete the chore. The trainer averaged the percent correct measure for each trial across all five trials to produce a performance measure for each session.

(2) Caregiver accuracy in observation and scoring. To determine if a correlation existed, a one-tailed Pearson correlation coefficient was calculated between the caregiver's scoring accuracy and her subsequent performance measures. The correlation should be directional and positive in that highly accurate scoring performance should be followed by high performance of the LTMPP.

(3) The number and level of prompts delivered by caregiver. If a child complied following caregiver instructions, 0 prompts were recorded for that trial. If a child required a modeling prompt, 1 prompt was recorded for that trial. If a child required a physical prompt, 2 prompts were recorded for that trial (the modeling and the physical prompts).

(4) Session duration. The duration of each trial was averaged across all five trials in a session to produce an average duration for each session.

(5) Child compliance. The number of trials where the child was compliant was divided by five total trials in each session and multiplied by 100% to produce a child percent child compliance measure.

(6) Child maladaptive behavior. Following each session, the trainer measured each child's problem behavior using a 10 s partial-interval data sheet (see Appendix F). The trainer divided each session's video recording of the caregiver attempting to use the LTMPP into 10 s intervals. If a problem behavior occurred during an interval, the trainer circled the letter *Y* on the data sheet for that interval. The trainer then divide the number

of intervals where any problem behavior occurred by the total number of intervals in that testing trial to produce a problem behavior measure. Then the trainer averaged the scores for each testing trial across all five testing trials for each session to produce a single problem behavior measure for each session.

Interobserver Agreement

To collect IOA for caregiver performance of the LTMPP, the trainer and one of three researchers independently observed and scored 50% of caregiver's video-recorded sessions using a checklist. The experimenters scored a step as correct if the caregiver engaged in the correct response at the correct time, incorrect if the caregiver omitted a response, and not applicable if that step was not required. We defined agreements as steps of the LTMPP in which the trainer and a researcher independently produced the same score for a given step. We defined disagreements as steps on which the observers independently produced different scores for a given step. The researchers then divided agreements by agreements and disagreements and multiplied by 100% to produce a percentage IOA score. IOA for caregiver performance of the LTMPP was (M = 91%; range = 76-100%) for the caregiver in Dyad A, (M = 93%; range = 80-100%) for the caregiver in Dyad B, and (M = 91%; range = 70-100%) for the caregiver in Dyad C.

IOA was also calculated using point-by point agreement for each step of the LTMPP, for the caregiver in each dyad (see appendix G). When scoring Dyad A, step eight received the lowest level of IOA (80%), IOA scores for all other steps were over 85%. When scoring Dyad B, IOA scores for all steps were over 85%, with steps 6, 7, and 10 receiving the lowest scores (86%). When scoring Dyad C, Step 5 received the lowest

IOA score (83%), IOA scores for all other steps were over 85%. Point-by-point IOA was consistent, across dyads and no patterns in scoring were found across dyads.

To collect IOA for child compliance data, The trainer and one of three researchers independently scored the child's performance during each testing trial. We defined agreements as both researchers scoring the child as being compliant or noncompliant for a given testing trial. We defined disagreements as the researchers differing in their scoring the child as being compliant or noncompliant for a given testing trial. We then divided agreements by agreements and disagreements and multiplied by 100 to produce a percentage IOA score. IOA for child compliance was (*M* = 91%; range = 60-100%) for the child in Dyad A, (*M* = 97%; range = 60-100%) for the child in Dyad B, and (*M* = 98%; range = 80-100%) for the child in Dyad C.

To collect IOA for child maladaptive behavior data, the trainer and one of three researchers independently observed and scored child problem behavior using a 10 s partial interval data sheet. We defined agreements as both researchers scoring the same behavior for each interval. We defined disagreements as the researchers scoring different behaviors occurring in the same interval. We then divided agreements by agreements and disagreements and multiplied by 100 to produce a percent IOA score. IOA for child maladaptive behavior was (*M* = 93%; range = 85-99%) for the child in Dyad A, (*M* = 91%; range = 79-96%) for the child in Dyad B, and (*M* = 95%; range = 87-99%) for the child in Dyad C.

Treatment Integrity

Treatment integrity was measured for 100% of sessions. The trainer assessed treatment integrity by reviewing the video recorded sessions and checking that the

procedures in each condition were recorded. In the instructions-only training condition, a video that depicted the trainer reading the instructions to the caregiver and answering her questions before each trial in a session, and a video showing the caregivers attempt at using the LTMPP were measured as treatment integrity. For Dyad A, treatment integrity was 96% for reading the instructions, and 100% for attempting the LTMPP. For Dyad B, Treatment integrity was 100% for reading the instructions and for attempting the LTMPP. For Dyad C, treatment integrity was 100% for reading the instructions and 99% for attempting the LTMPP. In the behavioral-observation training condition, treatment integrity was assessed by reviewing sheets that the caregivers filled out when scoring training videos as permanent product data, and by reviewing the video showing the caregivers attempt at using the LTMPP. Treatment integrity data was 100% for each dyad in this condition. In the feedback condition treatment integrity was measured by reviewing each caregivers video recorded attempt at using the LTMPP and the video recorded feedback. Treatment integrity was 100% for Dyad C, the only dyad to receive this condition.

Social Validity

The trainer assessed social validity using a 10 question survey based on Wolf (1978) (see Appendix H). Participants answered questions that utilized a Likert-type scale for responses. The trainer instructed the caregivers to circle the number that best described their answers to each question. Prior to starting the general procedure, the trainer gave the caregivers part of the questionnaire (questions 1 and 2). These questions pertained to the social validity of the behavior change goals. After completion of the

study, the trainer gave the caregivers the remainder of the questionnaire (questions 3 through 10). These questions pertained to the behavior change procedures and outcomes.

Results

Caregiver's Percent Correct Use of the LTMPP

Figure 1 shows the percent correct use of the LTMPP for each caregiver. For all phases, the solid line and filled circle represent the caregiver's percent correct use of the LTMPP for the target chore, and the dashed line and open circle represent the caregiver's percent correct use of the LTMPP for the probe chore. The horizontal line at 90% indicates the mastery criterion. The top panel, shows Caregiver A's performance. In the instructions-only training phase Caregiver A demonstrated a somewhat variable, yet no trend for the target chore (*M* = 58%; range = 48-71%) and a less variable, no trend for the probe chore (*M* = 62%; range = 57-64%). In the behavioral-observation training condition Caregiver A's percent correct use of the LTMPP increased to a high stable trend with little variability for the target chore (*M* = 90%; range = 81-96%) and the probe chore (*M* = 86%; range = 69-96%). The increase in percent correct use of the LTMPP occurred at the onset of the behavioral-observation condition, and little or no increase occurred in the instructions-only training condition.

The middle panel shows Caregiver B's performance. In the instructions-only training phase, Caregiver B demonstrated a slightly decreasing trend with little variability for the target chore (*M* = 70%; range = 60-77%) and for the probe chore (*M* = 67%; range = 58-81%). In the behavioral-observation training condition Caregiver B's percent correct use of the LTMPP was similar to that of the instructions-only training condition for the target chore (*M* = 74%; range = 60-89%) and for the probe chore (*M* = 77%; range = 74-81%).

The bottom panel shows Caregiver C's performance. In the instructions-only training phase Caregiver C demonstrated no trend with much variability for the target chore (*M* = 67%; range = 41-81%) and for the probe chore (*M* = 76%; range = 64-91%). In the behavioral-observation training condition Caregiver C's percent correct use of the LTMPP was flat with little variability for the target chore (*M* = 86%; range = 78-95%) and for the probe chore *M* = 81%; range = 74-84%). In the feedback condition Caregiver C's percent correct use of the LTMPP was a step-like-increasing trend with some variability for the target chore (*M* = 82% range = 66-94%) and a flat trend with little variability for the probe chore (*M* = 86%; range = 80-90%).

The preceding analysis of caregivers' percent correct use of the LTMPP does not consider the relation between child compliance and parent performance. Table 2 shows each step of the LTMPP, and the number of steps required at each prompt level. As shown in Table 2, the LTMPP consisted of 16 steps. It is important to note, however, that the number of steps the caregiver was required to perform depended on the child's compliance. Trials in which the children required physical prompting to complete the chore required 14 of the 16 steps (steps 4 and 11 were not applicable). This allowed the caregiver the opportunity to attempt 14 steps. If the caregiver made one error, percent correct use of the LTMPP was reduced by approximately 7%. Trials where the children responded to the model prompt required 10 of the 16 steps (steps 4 and 12-16 were not applicable). If the caregiver made one error, percent correct use of the LTMPP was reduced by 10%. Finally, trials where the children responded to instructions alone required only four of the 16 steps (steps 5-16 were not applicable). If the caregiver made one error, the percent correct use of the LTMPP reduced by 25% Thus, as child

compliance increased the likelihood of caregiver performance reaching the 90% mastery criterion decreased. The caregiver in Dyad B's performance did not increase past 75% for most sessions. This was due to the caregiver consistently making the same error on one out of four possible steps required to correctly use the LTMPP. Specifically, the caregiver consistently used general praise instead of the response-specific praise, even after the trainer gave the caregiver written instructions to use response-specific praise in the instructions-only training condition and demonstrated this step in the training videos in the behavioral-observation training condition. For example, this caregiver said "Good job, Jeff" following compliance, rather than response-specific praise such as "Good job making your bed" or "Good job cleaning up your toys."

This outcome does not take into account an interaction that occurred between caregiver performance and child compliance. The number of steps required of the caregiver varied from trial to trial based on the child's level of compliance. The child in Dyad B demonstrated a dramatic increase in child compliance in the behavioral-observation training condition, starting in the second session of the behavioral-observation training condition and continuing throughout this condition. There were 12 sessions in the behavioral-observation training condition for this Dyad, with five trials in each session, providing a total of 60 opportunities for the caregiver in Dyad B to perform the LTMPP. Of the 60 trials in the behavioral-observation training condition, 50 required the caregiver to perform only four responses, so her failure to successfully complete one step, resulted in her performing at 75% for most of the 50 trials in this condition. Her performance of the LTMPP was similar across the target and probe chores. Percent

correct use of the LTMPP for this caregiver was not sensitive to the changes that occurred with this dyad.

Figure 2 reflects the relation between caregiver performance and child compliance. The open circle data points with dashed lines represent percent child compliance for each session across target and probe chores, and are measured on the left Y-axis. The solid circle data points with solid line represent the number of prompts required by caregivers for each session, and are measured on the right Y-axis. For a given trial, a child may have responded to the caregiver's instruction (no prompt required), to the model prompt (one prompt required), or to the physical prompt (two prompts required). The total number of prompts required per session was calculated by adding the number of prompts used in each trial across all five trials in a given session.

The top panel shows that for Dyad A, ten prompts were required for each session in the instructions-only training condition (M = 10; range = 10), thereby indicating that physical prompting was required to complete the chore for every trial of every session in this condition. For this dyad, child compliance was low and stable (M = 0%; range = 0%) for all instructions-only training sessions. In the behavioral-observation training condition, a crossover pattern occurred. Specifically, a step-like reduction in caregiver delivered prompts occurred while a step-like increase in child compliance occurred. The number of prompts required to complete the chore decreased (M = 3; range 1-7) while child compliance increased (M = 42%; range = 0-80%).

The middle panel of Figure 2 shows the data for Dyad B. In the instructions-only training condition the number of prompts showed a flat trend with some variability (M = 7; range = 4-10) and child compliance was flat with little variability (M=9%; range = 0-

20%). In the behavioral-observation training condition the crossover pattern was observed akin to that observed by Dyad A. The number of prompts decreased markedly *M*= 1 (range: 0-10) and child compliance increased dramatically (*M* = 83%; range = 0-100%).

The bottom panel of Figure 2 shows the data for Dyad C. In the instructions-only training condition, the number of prompts required to complete the chore produced a flat trend with much variability (*M*=5; range = 0-10) and child compliance measures yielded a decreasing trend with much variability (*M* = 23%; range = 0-100%). In the behavioral-observation training condition, the number of prompts increased slightly compared to the Instructions-only training condition. (*M* = 6; range = 3-9) and child compliance decreased compared to the Instructions-only training condition (*M*= 13%; range = 0-60%). These data show that for Dyad C, the behavioral-observation training was not effective at decreasing the number of caregiver delivered prompts, nor did the procedure increase child compliance. When the feedback condition was applied, the crossover demonstrated by Dyads A and B occurred. The number of prompts showed a flat low trend with little variability *M*= 2 (range: 0-6) and child compliance increased (*M* = 69%; range 20-100%).

Prompt Level

Figure 3 shows the type of prompts delivered by caregiver for each session. The white part of each bar indicates the number of trials in which the child responded to the instructions without requiring a prompt. The light gray shading in a bar indicates the number of trials in which a modeling prompt was required to complete the chore. The dark gray shading in a bar indicates the number of trials where a physical prompt was

required in order to complete the chore. The top panel of Figure 3 shows the data for Dyad A. In the instructions-only training condition, the child required physical prompting to complete the chores in all trials across all sessions. In the behavioral-observation training condition, a shift in the level of prompting occurred. Fewer physical prompts were required; for the first time, the child in Dyad A started to respond to the instructions without requiring a prompt. After Session 16, the child in Dyad A required only modeling prompts when prompting was required.

The middle panel of Figure 3 shows the data for Dyad B. In the instructions only training condition, the child required physical prompting in ten sessions out of 13. In the behavioral-observation training condition, a shift in prompt level occurred similar to that demonstrated by Dyad A. In the first session of the behavioral-observation training condition (Session 14), the child required physical prompting for all five trials. For the remaining 11 sessions, physical prompting was never required again. The child responded to the instructions on most trials, and required only a modeling prompt on the others.

The bottom panel of Figure 3 shows the data for Dyad C. During sessions two and five the video recordings for one of the trials were damaged. The data for the remaining four trials is presented here. In the instructions-only training condition, the type of prompt required to complete the chores varied across trials. In session four, the child in Dyad C responded to the instructions in each trial and did not require prompting, yet during session six the child required physical prompting for each trial. In the behavioral-observation training condition, the number of physical prompts increased, and the number of responses to the instructions alone decreased. In the feedback condition, the

child required fewer physical prompts, resulting in two trials in the final four sessions requiring only a modeling prompt.

Duration

Figure 4 shows the duration of each trial averaged across all trials in a given session. The top panel shows the data for Dyad A. The duration of the target chore shows a decreasing trend with little variability across the instruction-only training condition (*M*= 194 s; range = 127-293 s), and the duration of the probe chore shows a flat trend with little variability (*M* = 218 s; range = 189-242 s). In the behavioral-observation condition, both the target and probe chores show a decrease in the amount of time required to complete the chores. A flat trend with little variability is shown for the target chore (*M* = 105 s; range = 79-127 s) and for the probe chore (*M* = 102 s range = 80-127 s).

The middle panel shows the duration data for Dyad B. In the instructions only training condition, the duration of the target chore shows a flat trend with little variability (*M* = 225 s; range = 174-270 s), as does the duration of the probe chore (*M* = 167 s; range 119-190 s). In the behavioral-observation training condition, the duration required to complete the chores decreased relative to the instructions-only training condition for the target chore (*M* = 119 s; range 72-204 s) as well as the probe chore (*M*= 79 s; range = 65-92 s).

The bottom panel shows the data for Dyad C. The duration of the target chore shows a flat trend with little variability across the instruction-only training condition (*M* = 243 s; range = 131-325 s) as does the duration of the probe chore (*M* = 59 s; range = s). In the behavioral-observation condition, the duration of the trials for both the target and

probe chores shows no change relative to the instructions-only training condition. A flat trend with little variability is shown for the target chore (*M* = 233 s; range = 167-312 s) and for the probe chore (*M* = 79 s; range = 64-94 s). In the feedback condition, the length of time to complete the target chore decreased relative to the behavioral-observation training condition (*M* = 193 s; range = 102-278 s) and small decrease occurred for the probe chore (*M* = 56 s; range = 39-70 s).

Child Compliance

Figure 5 shows the percentage of child compliance for each session. The shaded area indicates compliance below 60%. Less than 60% compliance was referred to by Forehand, (1977) as clinical noncompliance. The top panel of Figure 5 shows the data for Dyad A. In the instructions-only training condition, the child in Dyad A was clinically noncompliant 100% of sessions. During the behavioral-observation training condition, the child in Dyad A was clinically noncompliant for 65% of sessions. This shows a 35% increase in child compliance from the instructions-only training to the behavioral-observation training condition.

The middle panel of Figure 5 shows the data for Dyad B. In the instructions-only training condition the child was clinically noncompliant for 100% of sessions. In the behavioral-observation training condition the child in Dyad B was clinically noncompliant for 17% of sessions. This shows a 83% increase in child compliance from the instructions-only training to the behavioral-observation training condition.

The bottom panel of Figure 5 shows the data for Dyad C. In the instructions-only training condition, the child was clinically noncompliant for 89% of sessions. In the behavioral observation training condition, the child was clinically noncompliant for 82%

of sessions. This shows a 7% increase in child compliance from the instructions-only training to the behavioral-observation training condition. In the feedback condition, the child was clinically noncompliant for 15% of sessions. This shows a large increase in compliance relative to the behavioral-observation training and instructions-only conditions.

Child Maladaptive Behavior

Figure 6 shows the percent maladaptive behavior for each session. The top panel shows the maladaptive behavior for the child in Dyad A. In the instructions-only training condition, maladaptive behavior occurred during the target chore sessions *M*=50% (range: 21-66%) and during the probe chore sessions *M*=45 (range: 30-58%). In the behavioral-observation training condition, maladaptive behavior reduced slightly relative to the instructions-only training condition for the target chore sessions *M*=41 (range: 20-63%) and the probe chore sessions *M*=34 (range: 26-44%).

The middle panel shows the maladaptive behavior for the child in Dyad B. In the instructions-only training condition, maladaptive behavior occurred during the target chore sessions *M*=29% (range: 17-54%) and in the probe chore sessions *M*=33 (range: 22-45%). In the behavioral-observation training condition, maladaptive behavior was reduced by almost half of that demonstrated in the instructions-only training condition during the target chore sessions *M*=15 (range: 4-38%) and to a smaller degree during the probe chore sessions *M*=25 (range: 15-43%).

The bottom panel shows the maladaptive behavior for the child in Dyad C. In the instructions-only training condition, maladaptive behavior occurred during the target chore sessions *M*=19% (range: 1-38%), and in the probe chore sessions *M*=22 (range: 8-

46%). In the behavioral-observation training condition, maladaptive behavior increased slightly relative to the instructions-only training condition, during the target chore sessions *M*=22 (range: 32%) and also in the probe chore sessions *M*=38 (range: 32%). In the feedback condition, maladaptive behavior changed very little during in the target chore sessions *M*=25 (range: 34%), and in the probe chore sessions *M*=23 (range: 17%).

Social Validity

Table 3 shows each caregiver's answers for each question on the social validity questionnaire. All three caregivers found the behavior change goals to be very important, the behavior change procedures to be acceptable, and the behavior change outcome to be effective.

Correlation: Caregiver Observation Accuracy and Caregiver Performance

A one-tailed Pearson correlation coefficient (r) was calculated between the caregiver accuracy at observation scoring and the caregiver accuracy at performing the LTMPP. It is assumed that a directional correlation should be present in that more accurate scoring should produce better subsequent performance. Both measures were averaged for each session, for each caregiver individually. There was no significant correlation between caregiver accuracy at scoring the training videos, and subsequent accuracy in performing the LTMPP for Caregiver A, $r(17) = .098$, $p<.412$; Caregiver B, $r(12) = .34$, $p<.497$; or Caregiver C, $r(11) = -.59$, $p<.521$. This suggests that there was no correlation between these accuracy measures.

Discussion

Training caregivers to perform the LTMPP by teaching them to observe and score video recordings produced increases in caregiver performance of the LTMPP and increases in child compliance for Dyads A and B. This change was not reliable or systematic across all three Dyads as Dyad C required remedial feedback to produce the same changes. The data allow a post-hoc analysis of each dyad individually; the changes in behavior that occurred for caregivers and children will each be discussed separately in the discussion.

Caregivers

The caregiver in Dyad A, demonstrated an immediate increase in performance of the LTMPP, eventually reaching mastery level, in the behavioral-observation training condition. Her performance of the LTMPP was similar across the target and probe chores. The caregiver in Dyad B demonstrated an increase in performance of the LTMPP sufficient to produce child compliance despite not reaching mastery criterion. Her performance of the LTMPP was similar across the target and probe chores. The caregiver in Dyad C like those in Dyads A and B did not reach mastery level performance of the LTMPP in the instructions-only training condition. In the behavioral observation-training condition mastery level performance was not demonstrated. Only in the feedback condition did this caregiver's performance reach mastery. Her performance of the LTMPP was similar across the target and probe chores.

Training Methods Across Dyads

Instructions-only Training. The instructions-only training condition was insufficient to produce mastery level performance for any caregiver. This was expected,

based on Alvero and Austin (2004) who gave participants instructions on how to perform office tasks safely in an information phase which was similar to the current instructions-only training condition. In both studies increases in safe behavior relative to baseline were inconsistent and minimal across participants. Ward-Horner and Sturmey (2012) also found that the instructions component of behavioral skills training was insufficient to train teachers to correctly perform a functional analysis on no more than 22% of trials. The low level of performance in both studies suggests that training should not rely solely on instructions.

Behavioral-observation Training

Training videos. In two of the three dyads (Dyads A and B), caregiver performance of the LTMPP in the behavioral-observation training condition improved relative to the instructions-only training condition. For Dyad C, the behavioral-observation training condition was insufficient to increase this caregiver's correct use of the LTMPP. Only when verbal feedback was provided did this caregiver master the LTMPP. This outcome raises questions about what variables led to caregiver improvement for Dyads A and B, and why remedial feedback was required for the caregiver in Dyad C to improve.

There are several variables that may account for changes in caregiver behavior after conducting behavioral-observations. One variable is the degree of similarity between the training videos used in the behavioral-observation training condition and the real life situation the caregivers encountered during a trial. Each of the chores that the caregivers trained their children to complete could be done in a variety of ways. The training videos only demonstrated one method of completing each chore. For example a

shirt can be put on by placing it over the head first or by placing the arms in the sleeves first. A given training video may have demonstrated the completion of a chore in a similar or different way compared to the dyad's history. The degree of similarity between what was trained and the dyad's history may account for the difference in chore compliance between Dyad A and C. Conducting a task analysis of the way the children perform each chore prior to making the training videos would allow for the creation of training videos that demonstrated the chores more similarly to the children's history.

Another variable is the complexity of the responses that the caregiver's were trained to perform. Much of the research on the observer effect has been focused on training participants to perform responses that do not require interaction between the participant and another person. Specifically postural body positions while engaging in computer, office, or assembly tasks (Alvero & Austin, 2004; Sasson & Austin, 2005; Alvero & Austin, 2006; Sasson, et al. 2007; Alvero, et al. 2008). Sasson and Austin (2005) trained participants to conduct live observations of coworkers and found that the participants observed a representative sample of responses compared to participants shown training videos. This still did not require the participant to interact with another person, however, and it is possible that responses learned via the observer effect may not extend to interpersonal behavior due to the complexity of these responses.

In the current study, the caregivers were trained to interact with their children rather than inanimate objects. Therefore, the responses that caregivers were trained to perform in this study were more complex that those of typical behavioral-observation research. Alvero et al. (2008) found that some postural responses demonstrated dramatic changes for example the flat positioning of the feet on the floor and other responses

showed less dramatic changes. The degree to which a response will change as a result of behavioral-observation may be related to how complex the response is.

Feedback. Another variable that may have influenced caregiver performance in the behavioral-observation training condition is feedback. This experiment provided instructions in the instructions-only training condition, video modeling in the behavioral-observation training condition, and rehearsal during each caregiver's attempt at using the LTMPP. During behavioral-observation training, feedback was not provided by the trainer, it was provided by the children in the form of compliance. The children in Dyads A and B demonstrated increased compliance in the second session of the behavioral-observation training condition. This increase in child compliance may have reinforced any caregiver responses that preceded child compliance, specifically the LTMPP. The caregiver in Dyad A continued mastery level performance of the LTMPP. The caregiver in Dyad B continued performance of the LTMPP at the 75% level. In both cases caregiver performance was maintained. In contrast, the child in Dyad C demonstrated 0% compliance for the first three sessions of the behavioral observation training condition. This low level of compliance may have extinguished the caregiver's responses. The difference in child-provided feedback may have resulted in the caregiver in Dyad C not mastering the LTMPP without additional feedback provided by the trainer. Ward-Horner and Sturmey (2012) found that feedback was the most effective component of BST. This could explain why the caregiver in Dyad C only reached mastery level performance after receiving feedback from the trainer.

Correlation between caregiver scoring accuracy and performance. Literature on the observer effect has looked for a correlation between accuracy at scoring and

subsequent performance and has found mixed results. In some cases, a correlation has been found (Sasson & Austin, 2005) and in other cases, a correlation has not been found (Alvero, et al. 2008). In the current experiment, a correlation was not found between the caregiver's accuracy at scoring the video model's behavior and subsequent performance of the LTMPP. Of the studies that looked for a correlation between scoring accuracy and subsequent performance correlations were not typically found. Procedural variations between studies such as the complexity of the response and the small number of responses typically measured in these studies may account for the differences in correlation data across studies.

Sasson, et al. (2007) explored the relationship between accuracy of observation and subsequent performance. This study included 11 hospital workers who used computers for much of their jobs. The researchers measured ergonomically safe positions of the head, neck, back, shoulders, wrist, and feet. Half of the participants conducted behavioral-observations while the other half did not. The researchers provided both groups with information pertaining to the safe and unsafe position of each body part while working as well as feedback on their performance. Those who conducted behavioral observations had larger increases in safe behavior than those who did not. This experiment found a correlation (r = .92, r = .70) between observer accuracy and performance for two of the 11 participants. Despite the strength of these correlations, the small number of correlations relative to the number of participants suggests that a correlation between scoring accuracy and subsequent performance is not a robust finding.

Children

The efficacy of caregiver training procedures should be measured not only in terms of changes in caregiver behavior but also by corresponding changes in child behavior. Specifically, if caregivers are taught procedures to increase child compliance, improvements in caregiver behavior should be followed by improvements in child behavior. While caregivers demonstrated varied results their children did as well. Figure 2 shows the interaction between caregiver and child behavior and will be used to describe each child's performance in relation his caregiver.

The child in Dyad A demonstrated zero compliance for the entirety of the instructions-only training condition. In the behavioral-observation training condition, child compliance increased. The child in Dyad B also demonstrated low rates of compliance in the instructions-only training condition. In the behavioral-observation training condition, the child showed an increase in child compliance. The child in Dyad C demonstrated a variable rate of compliance in the instructions-only training condition. In the behavioral-observation training condition, increases in child compliance did not occur. In the feedback condition an increase in child compliance occurred similar to compliance demonstrated by the children in Dyads A and B in the behavioral-observation condition. In all three dyads, when caregiver performance increased so did child compliance. When caregiver performance did not increase, neither did child compliance. For Dyads A and B, the behavioral-observation training condition was required and for Dyad C, feedback was required to produce this change.

Tarbox et al. (2007) found similar increases in child compliance when they trained caregivers to use a LTMPP using BST. Thus, for Dyads A and B, behavioral-observation training was as effective as BST. This finding can help to inform practice if

behavioral-observation training is used before BST. One benefit of using behavioral-observation training before using BST is that behavioral-observation training does not require a behavior analyst to provide feedback. Thus, a larger population of caregivers can receive training relatively inexpensively if a series of training videos are made available. Those that require feedback could then be given training using BST.

The child in Dyad A showed a 35% increase in child compliance in the behavioral-observation training condition relative to the instructions-only training condition, while the child in Dyad B showed an 83% increase and the child in Dyad C showed a 7% increase. This outcome differs from that of Miles and Wilder (2009). In their experiment, child compliance increased slightly (11% and 18%) for only two of the three children who participated. The third child demonstrated a small reduction in compliance (2%). Both the current study and that of Miles and Wilder (2009) trained caregivers to use a LTMPP. Miles and Wilder trained caregivers using BST and the current experiment used behavioral observation. It is possible that procedural variations accounted for the difference in child compliance. Some of these procedural differences are: (1) Participants: Miles and Wilder trained a teacher, a nanny and one mother. All of our caregivers were mothers; 2) Children: Miles and Wilder worked with one child diagnosed with autism, one child with an unspecified learning disability, and a typically developing child. All of our children were diagnosed with a developmental disability; (3) Location: Miles and Wilder trained two caregivers in their home and one in a classroom. We trained all of our caregivers in their homes. Additionally, the LTMPP used by Miles and Wilder (2009) differed from the LTMPP used in the current study in the following ways: (1) Miles and Wilder required eye contact before the caregiver made a demand;

(2) Caregivers were trained to only make one demand at a time; (3) Caregivers were trained to articulate the demand clearly; (4) Caregivers were trained to avoid phrasing the demand as a question; (5) Caregivers were trained to not repeat the demand; (6) Caregivers were trained to wait 10 s following the request; (7) response specific praise was not required; (8) Caregivers were trained to record data and finally; (9) Caregivers were trained to wait at least 5 s between demands. Any one or combination of these procedural differences may account for the difference in child compliance reported by Miles and Wilder (2009) and the increases in child compliance demonstrated in the current study.

Some researchers have looked at ways of improving the LTMPP after it was demonstrated to be ineffective, Wilder, et al. (2012) evaluated the efficacy of three procedural changes. The first modification was to eliminate the modeling prompt. The second modification was to reduce the inter-prompt interval (IPI) from 10 s to 5 s. The third modification was to use a differential reinforcement of incompatible behavior (DRI) procedure where a preferred edible was exchanged for the preferred item following compliance. Removal of the modeling prompt was effective at increasing compliance and decreasing problem behavior for one child. The removal of the modeling prompt combined with reduction of the IPI was effective for a second child. The remaining two children did not respond to the first or second modifications. Increases in compliance and decreases in problem behavior were only demonstrated when DRI was used.

The researchers attributed the increase in compliance when the modeling prompt was removed to a reduction of the demand:physical prompt ratio from 3:1 to 2:1, which they theorized produced greater stimulus control by the demand. The researchers

attributed increases in child compliance when the IPI was reduced from 10 s to 5 s to an increase in temporal contiguity between noncompliance and physical guidance. Increases in compliance were due to the physical prompt becoming a better punisher for noncompliance because of the smaller latency between noncompliance and physical prompting. Finally, the increases in compliance demonstrated by two children when DRI was used suggested that this procedure should be used before attempting a LTMPP as it is less intrusive and highly effective. The researchers pointed out that the variables maintaining noncompliance may be different for each child. Further, the variables that determine the efficacy of LTMPPs may also differ for each child.

Wilder and Atwell (2006) also evaluated a LTMPP to increase compliance in preschool children. Six dyads, consisting of a child and a parent, an instructional aide, or a graduate student, participated. LTMPP alone was sufficient to increase compliance relative to baseline for four of the six children. The remaining two children required DRA to increase compliance. These findings are similar to the current experiment in that the LTMPP alone was sufficient for only two thirds of the dyads. In both the present research and that of Wilder and Atwell (2006) behavioral interventions other than the LTMPP were required to increase child compliance in some cases. This demonstrated that although effective for some, LTMPPs alone are not sufficient to produce increases in child compliance for all children.

LTMPPs present consequences following child noncompliance. It is possible that these consequences in conjunction with the learning histories of the children are responsible for differential child outcomes. Evidence for this possibility comes from a study by Rodriguez, Thompson, and Baynham (2010) evaluated the effects of contingent

attention and escape on noncompliance. Two typically developing preschool children and one preschool child diagnosed with Down syndrome participated. An experimenter asked the children to clean up some paper by placing it in a trash can. The researchers conducted a functional analysis of child compliance using attention and escape conditions. In an attention condition, compliance was followed by a break from the task and termination of experimenter attention and noncompliance was followed by verbal cajoling and physical prompting. In an escape condition, the contingencies were reversed: compliance was followed by verbal praise and continued physical prompting to complete the task, while noncompliance was followed by removal of the task and experimenter attention. The researchers found that for all three participants noncompliance increased when it was followed by verbal attention despite physical prompting to continue. Suggesting that compliance training procedures that involve presenting or increasing attention following noncompliance may actually increase noncompliance via positive reinforcement with adult attention. The LTMPP used in the current experiment involves increasing caregiver attention in the form of providing a repetition of the verbal demand, modeling, and physical prompts contingent on noncompliance. It is possible that this attention was responsible for the low level of compliance demonstrated by the child in Dyad C in the behavioral-observation condition. Additionally, compliance from the children in Dyads A and B may have been negatively reinforced with escape from the prompts. Functional analyses of noncompliance prior to selecting treatments using LTMPPs may indicate that when noncompliance is reinforced with attention, LTMPPs are contraindicated.

In addition to looking at the consequences of noncompliance, antecedent stimuli may also effect child compliance. As such, researchers have examined antecedents to noncompliance. Wilder, Allison, Nicholson, Abellon, and Saulnier (2010) evaluated an antecedent procedure to increase child compliance in preschool children. In Experiment 1, three 3-year old boys, one of whom was diagnosed with autism, were given a verbal rationale that described why the child should comply with a graduate-student therapist's requests. For example, the therapist would instruct the child to hand him or her an item by saying "Give me the ___," followed by a rationale for complying, such as "Because it is good to do what adults say." The children were engaged in a preferred activity during the therapist's requests so compliance required the children to terminate the preferred activity. All three boys demonstrated 0% compliance in a baseline condition (without the rationale), When the rationale was added, compliance increased to 30% for one child and remained at 0% for the other two. Thus, the addition of an antecedent rationale did not reliably increase compliance. Following a second baseline condition, a treatment condition that used a LTMPP was added for two of the boys. The LTMPP increased child compliance by 66% for one boy, and had no effect (0%) for the second boy. These results demonstrate that even when used by a trained therapist, LTMPPs do not consistently produce child compliance. This has bearing on the current study in that, to some extent, even when a LTMPP is performed correctly; corresponding improvement in child behavior is not guaranteed.

In summary, child compliance may be a function of procedural variations to the LTMPP including antecedents and consequences provided by this procedure. Functional analyses may be required before determining the best treatment for noncompliance in a

given child. Finally, other procedures such as differential reinforcement of alternative and incompatible behavior may be better treatment alternatives to LTMPPs for increasing child compliance.

Those unfamiliar with the nonconcurrent multiple baseline design (Watson & Workman, 1981) may raise questions regarding the efficacy of this design in determining whether changes in a dependent variable can be attributed to changes in an independent variable. The nonconcurrent multiple baseline design is similar to the concurrent multiple baseline design except that each session does not occur contemporaneously across each of the three dyads (Christ, 2007). This design was chosen for this experiment due to the age of the children and the time required for each session. Seeing three dyads during after school hours was logistically not possible however each dyad was seen in the same week for a given session. The nonconcurrent multiple baseline design provides logistic flexibility (Harvey, May, & Kennedy, 2004). Like concurrent multiple baseline designs comparisons can be made between baseline and treatment phases across staggered baselines of increasing length. The assumption of this design are that the trend and variability of behavior in baseline can be assumed to be the same after treatment is implemented if the independent variable does not affect the dependent variable.

Limitations

Variables that influence the efficacy of behavioral-observation training. Like any treatment package, one or a combination of components may have been responsible for behavior change. Determining which components of this treatment package are necessary and sufficient may help make caregiver training using behavioral-observation techniques a viable treatment option. The behavioral-observation training package

consisted of several components: (1) multiple observations of a video model; (2) caregivers scoring the behavior of a video model; (3) a parent video model demonstrating varying levels of accuracy; (4) a child video model demonstrating varying levels of compliance; (5) caregiver accuracy at scoring the behavior of the parent video model; and (6) rehearsal of the LTMPP 5 times per session. At this time we cannot say which component or combination of components may have been responsible for the changes in caregiver behavior demonstrated by Dyad A and B and the lack of change demonstrated in Dyad C. A component analysis may lead to a better understanding of the necessary and sufficient components of this package and may lead to a more efficient or effective version of behavioral-observation training.

This experiment extends the observer effect to new applied settings and to training new responses. Specifically, caregivers of children with developmental disabilities and noncompliance treatment. These findings demonstrate the utility of behavioral-observation training for caregivers of children with autism, and opens avenues for future exploration, such as academic tasks, and teaching people other than caregivers, such as staff or siblings.

Variables that influence generalizability of these findings to other populations. The children in this study were not systematically screened for confirmation of the diagnosis of their disability because it is not believed that their disability specifically produced their noncompliance. This may raise questions as to the generality of these findings to other populations. Future studies should examine the observer effect across a variety of populations including children with and without diagnosed disabilities.

Then conclusions as to the efficacy of this form of caregiver training across specific disabilities can be made.

Future directions

Future research should examine factors that may influence the efficacy of behavioral-observation training including the contents of training videos. Specifically what components make up an effective training video? Other factors include addressing feedback provided by children to their caregivers. For example, a typical extinction procedure will produce a temporary increase in frequency duration and intensity of existing problem behavior and novel behavior. If a caregiver reduces demands in response to an extinction burst, a child who is noncompliant may continue to be noncompliant.

In addition to determining factors that influence the efficacy of caregiver training using behavioral-observation procedures, future research should continue to look for variables that influence the efficacy of LTMPPs. LTMPPs may only be effective for children with whom noncompliance is reinforced with escape as this procedure includes an escape extinction component as a caregiver advances to each prompt level; however, as demonstrated by Rodriguez et al. (2010), noncompliance that is maintained by caregiver attention may actually increase when LTMPPs are used as LTMPPs increase the amount of caregiver attention contingent on noncompliance.

Conclusion

The literature on the observer effect has demonstrated that participants can learn from conducting observations of others in simulated and applied work settings, using live and video models, across a variety of tasks. The current experiment extends the utility of

the observer effect to another applied setting, namely the homes of families, and evaluated its use as a training package for parents of children with developmental disabilities.

This method of training allowed caregivers of children with autism to improve their children's compliance with chores. It should be noted here that the caregivers did not teach their children new skills. Child compliance was brought under stimulus control of their caregivers request via the LTMPP. These children may benefit from learning chores in a number of ways. First, children with autism may experience the same benefits of completing routine chores as typically developing children described by Rossman (2002). These benefits include improved relationships with peers and family and educational benefits. Second, the ability to complete chores may increase independence for a child with autism if the chores include activities of daily living and self-help skills. Third, a child who can complete a number of chores can also help a busy family, freeing up caregiver time for other beneficial activities such as assisting the child with school work.

Teaching caregivers to observe and score the behavior of a video model required very little interaction between the caregiver and the trainer. Once a caregiver is able to observe and score, a variety of procedures can be demonstrated via video. It may be possible to teach caregivers additional procedures using this method. Producing each of the training videos that were used in this experiment was time consuming was not efficient considering other training methods such as BST do not require this step; however, if a library of training videos were to be created across a variety of training stimuli, procedures, and demonstrating a variety of child behaviors, subsequent training

using the observer effect would require no additional expense. This would open new avenues of training a variety of skills using the observer effect Effective caregiver training that requires little contact with trainers may provide reduced costs compared to traditional on-on-one caregiver training, making effective caregiver training available to a larger number of families of children with autism.

Table 1

Details of the Training Videos Used in the Behavioral-observation Training Condition

Video	Chore	Prompt	Parent % Correct	Child Compliance	Recording Length (s)
1	Clean Up Toys	I	100%	Yes	17
2	Clean Up Toys	I+M	100%	No	33
3	Clean Up Toys	I+M+P	100%	No	49
4	Clean Up Toys	I	75%	Yes	22
5	Clean Up Toys	I+M	80%	No	28
6	Clean Up Toys	I+M+P	64%	No	28
7	Make Bed	I	100%	Yes	37
8	Make Bed	I	50%	Yes	39
9	Make Bed	I+M	100%	No	75
10	Make Bed	I+M	80%	No	71
11	Make Bed	I+M+P	100%	No	103
12	Make Bed	I+M+P	57%	No	70
13	Wash Hands	I	100%	Yes	31
14	Wash Hands	I	50%	Yes	28
15	Wash Hands	I+M	100%	No	54
16	Wash Hands	I+M	60%	No	48
17	Wash Hands	I+M+P	100%	No	53
18	Dressing	I	100%	Yes	34
19	Dressing	I	50%	Yes	34
20	Dressing	I+M	100%	No	76
21	Dressing	I+M	60%	No	64
22	Dressing	I+M+P	100%	No	128
23	Dressing	I+M+P	71%	No	92

Note. The details of the training videos used in the behavioral-observation training condition. In the prompt column *I* indicates instructions, *M* indicates modeling prompt, and *P* indicates physical prompt.

Table 2

Percent Correct Values for the LTMPP at Each Prompt Level

Step	Instructions	Instruction	Model Prompt	Physical Prompt
1	Call the child by name	25.0%	10.0%	7.14%
2	Request the target behavior.	25.0%	10.0%	7.14%
3	Wait for at least 3 seconds before speaking	25.0%	10.0%	7.14%
4	If the response occurs, provide response specific praise.	25.0%	NA	NA
5	If the response did not occur, do not praise, go to step 6	NA	10.0%	7.14%
6	Call the child by name	NA	10.0%	7.14%
7	Repeat the request for the target behavior and	NA	10.0%	7.14%
8	Demonstrate the correct response for the child	NA	10.0%	7.14%
9	Say " Now you try"	NA	10.0%	7.14%
10	Wait for at least 3 seconds before speaking	NA	10.0%	7.14%
11	If the response occurs, provide response specific praise.	NA	10.0%	NA
12	If the response did not occur, do not praise, go to step 13	NA	NA	7.14%
13	Call the child by name	NA	NA	7.14%
14	Repeat the request for the target behavior and	NA	NA	7.14%
15	Use hand over hand guidance to complete the response.	NA	NA	7.14%
16	Do not praise.	NA	NA	7.14%
	Total	100%	100%	100%

Note. Percent correct value for each step of the LTMPP, contingent on child compliance at each prompt level.

Table 3

Caregiver answers to the social validity questionnaire.

		Caregiver Response		
	Question	**A**	**B**	**C**
1	How important to you is your child's ability to follow directions?	5	5	5
2	How important to you is learning to teach your child to follow directions?	5	5	5
3	How acceptable to you was observing videos of people teaching children to follow directions?	5	5	5
4	How acceptable to you was scoring the videos	5	5	5
5	How acceptable to you was asking your child to follow a direction?	5	5	5
6	How acceptable to you was showing your child how to follow a direction?	5	5	5
7	How acceptable to you was the procedure of physically guiding your child to follow a direction?	5	5	5
8	How effective was your training at changing your behavior?	5	5	5
9	How effective was your training at changing your child's behavior?	5	5	4
10	How effective was the overall outcome of the study?	5	5	5

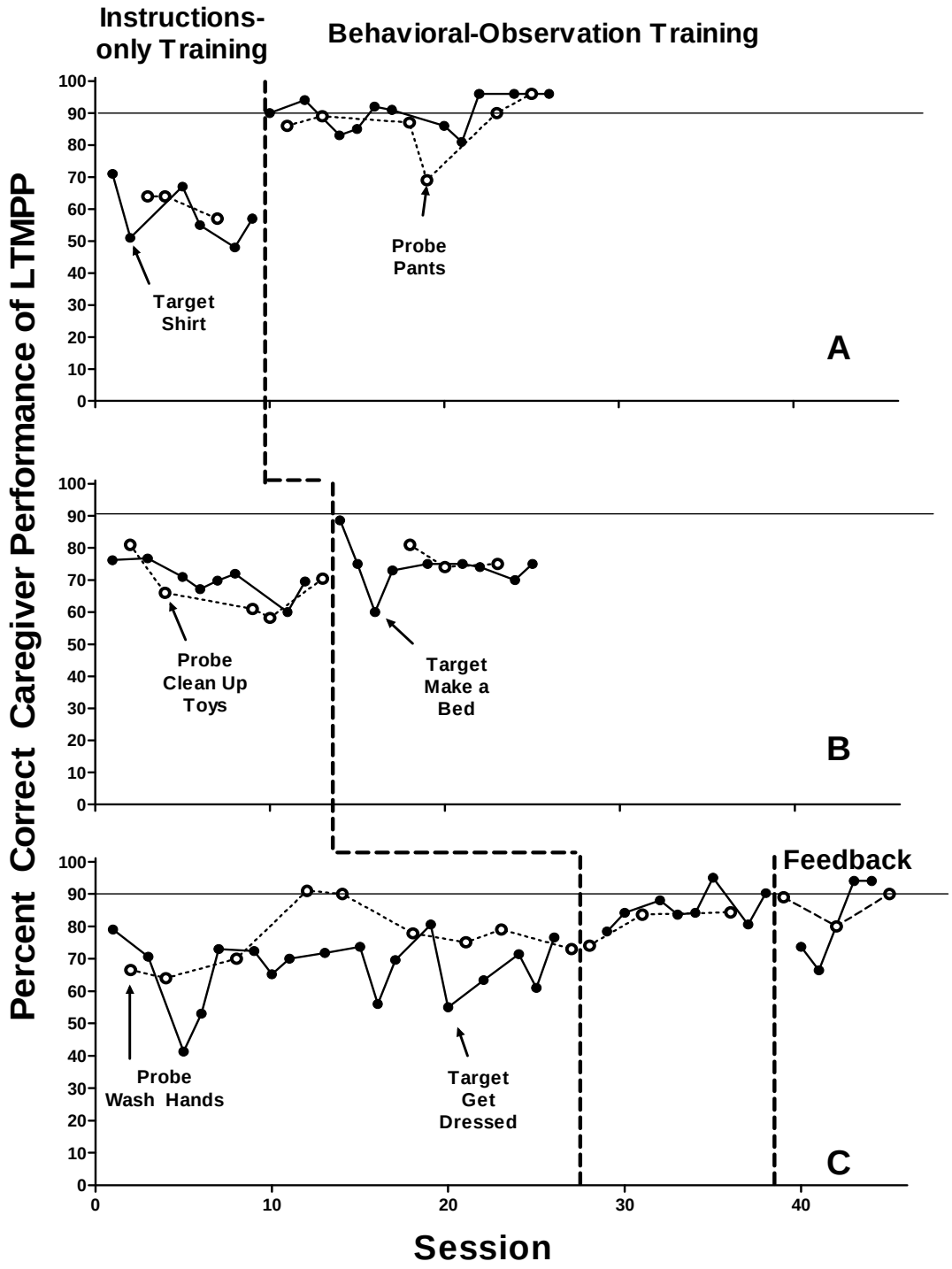

Figure 1. Caregiver percent correct performance of the LTMPP, across dyads, for the target and probe chores. The horizontal line at 90% indicates the mastery criterion.

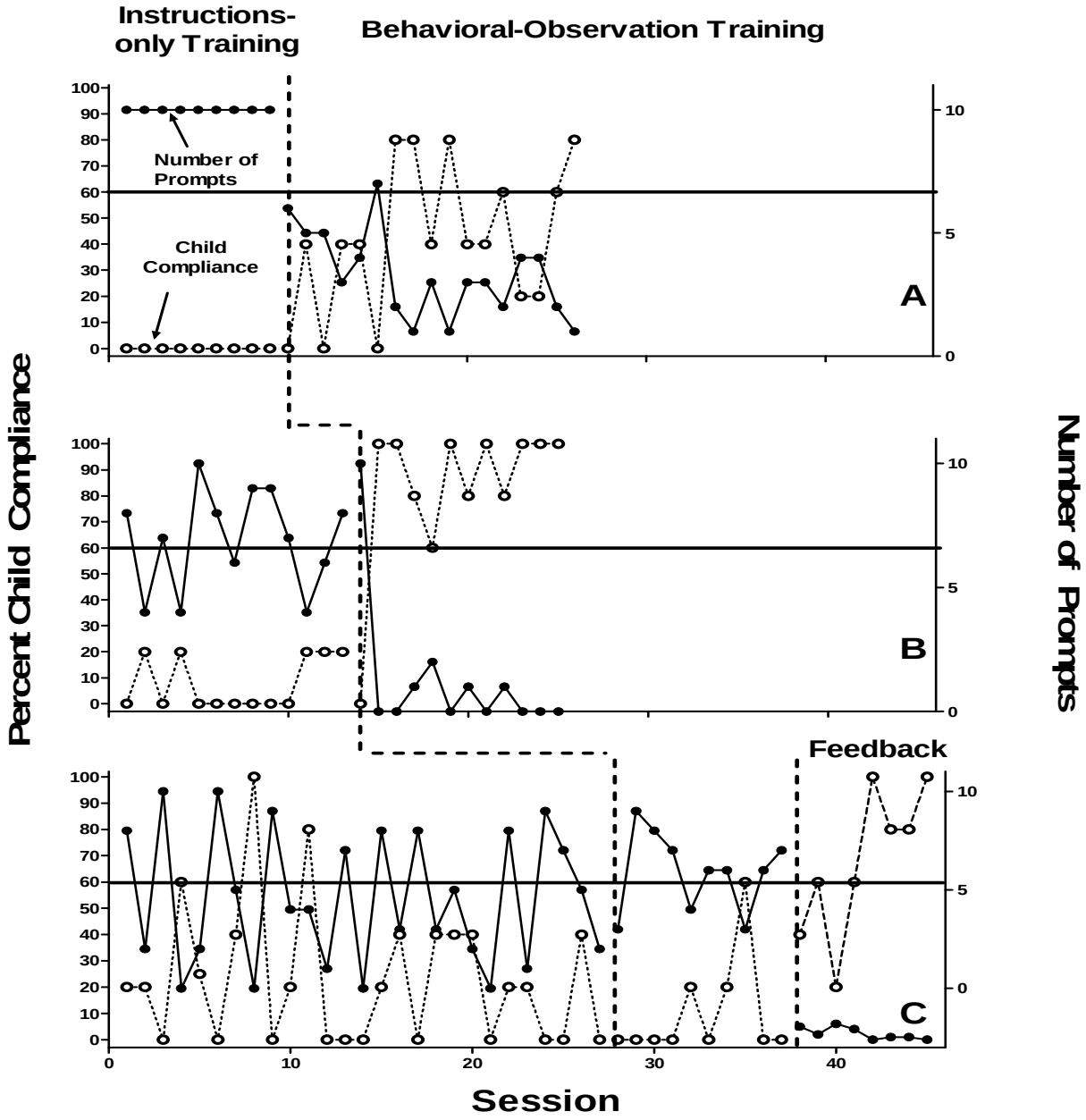

Figure 2. The number of prompts delivered by caregivers is measured on the right Y-axis using the solid line and square for the target chores and the dashed line and open square for the probe chores. Child compliance is measured on the left Y-axis using the solid line and circle for compliance to the target chores and the dashed line and open circle for the probe chores. The solid line at 60% indicates clinical noncompliance.

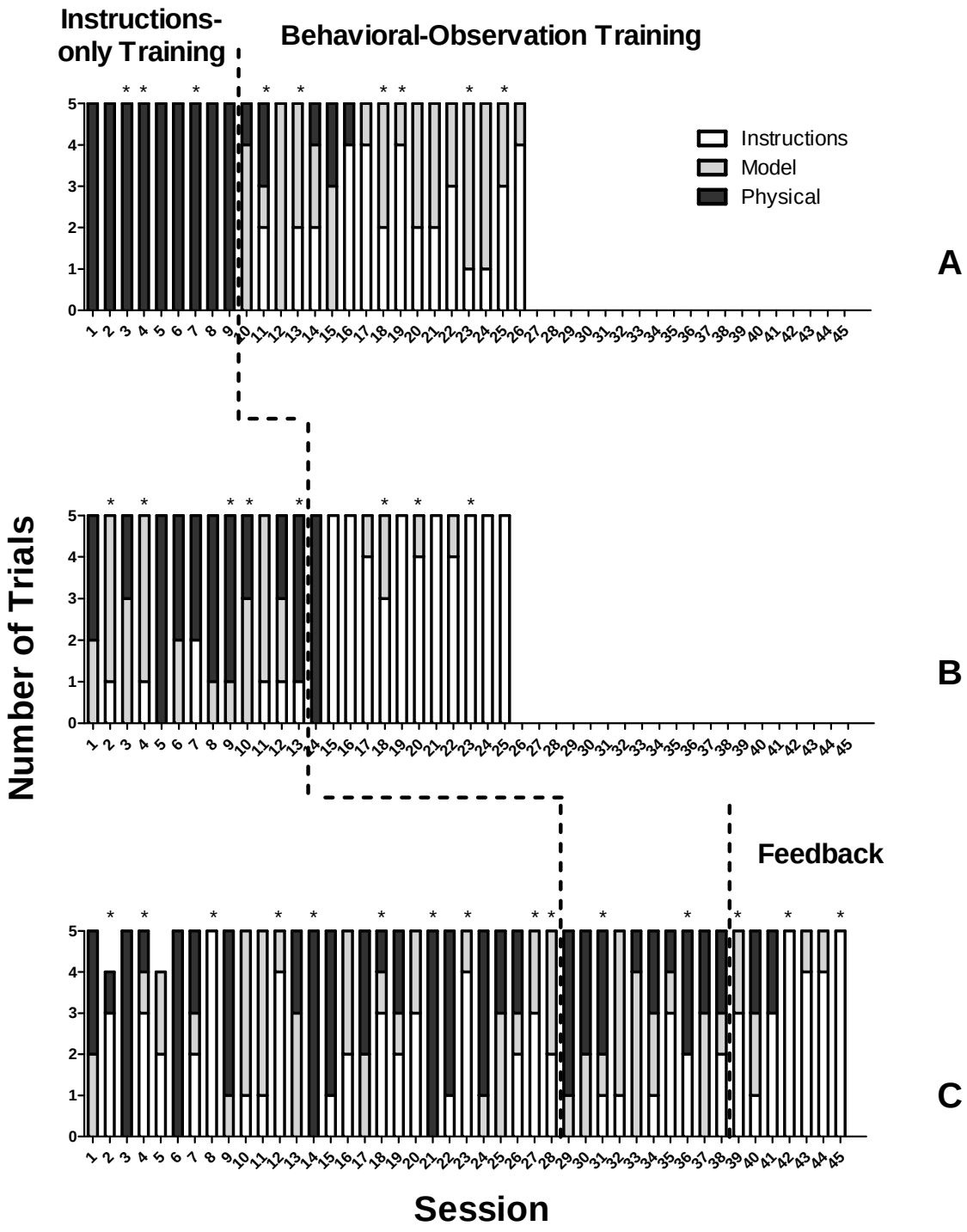

Figure 3. The number and type of prompts required to produce child compliance in each session, across all three dyads. The asterisks indicate probe chore sessions; target chore sessions do not have an asterisk.

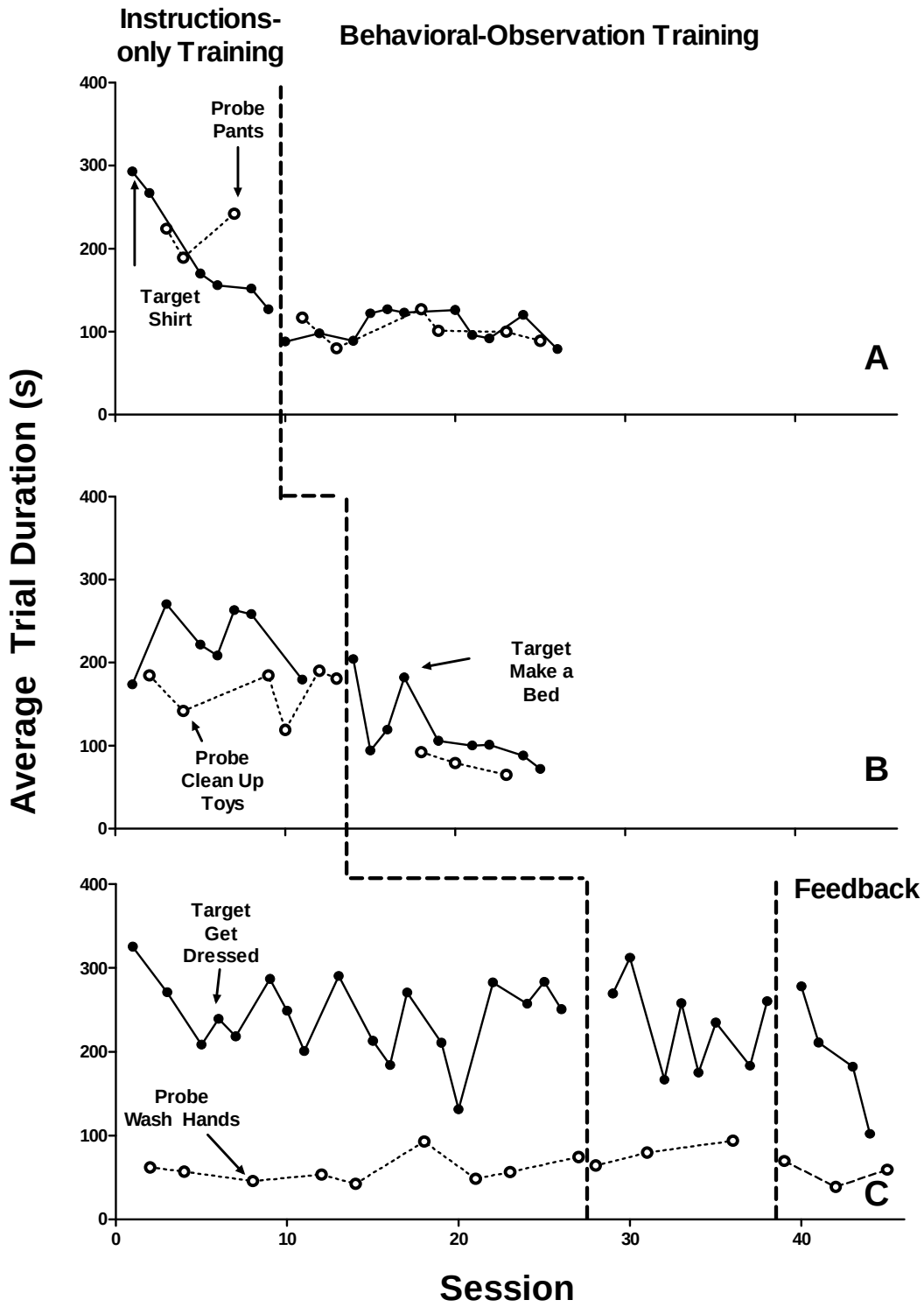

Figure 4. Average session duration in seconds, across target and probe chores and across dyads.

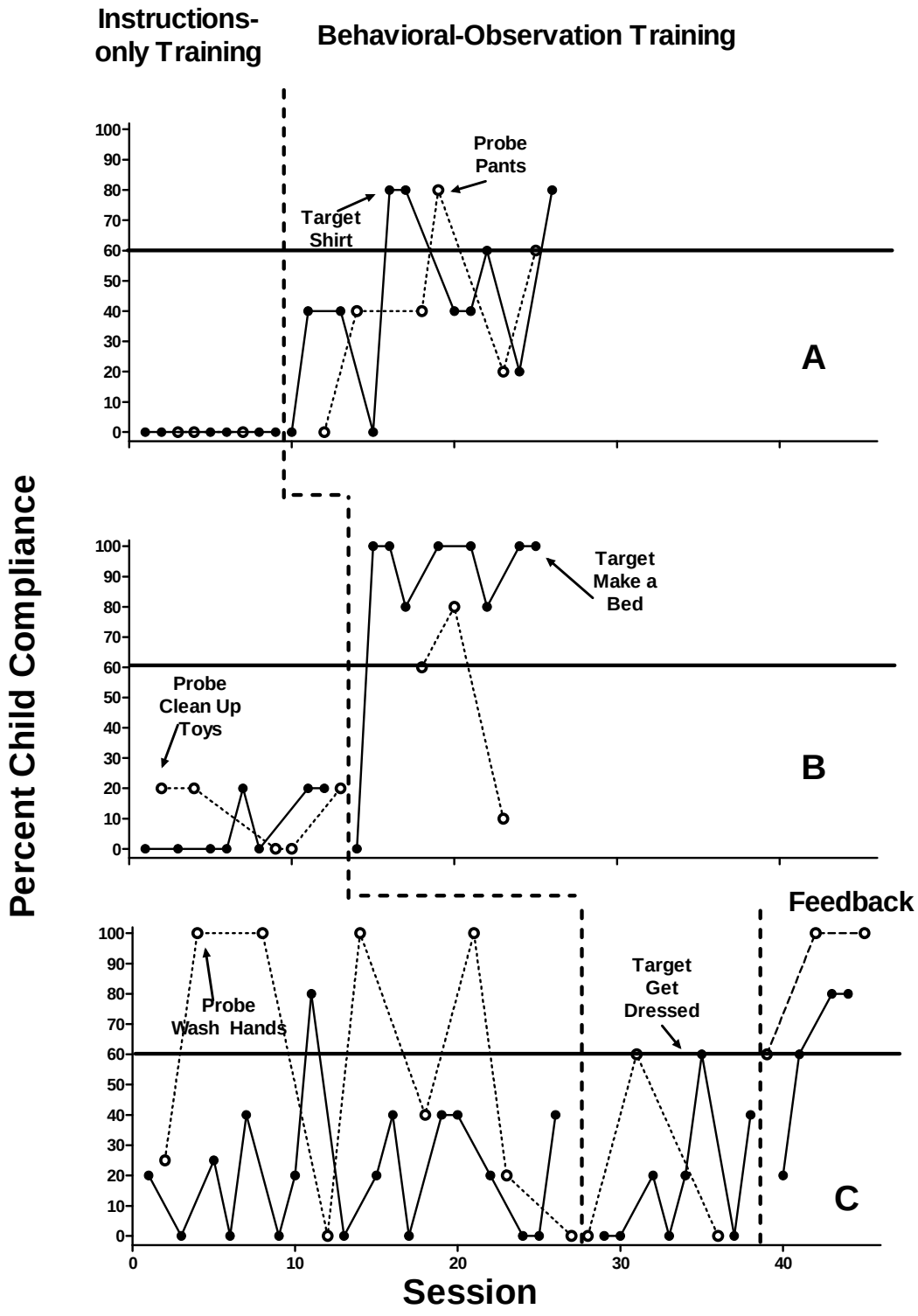

Figure 5. Child compliance by session. The solid line at 60% indicates clinical noncompliance.

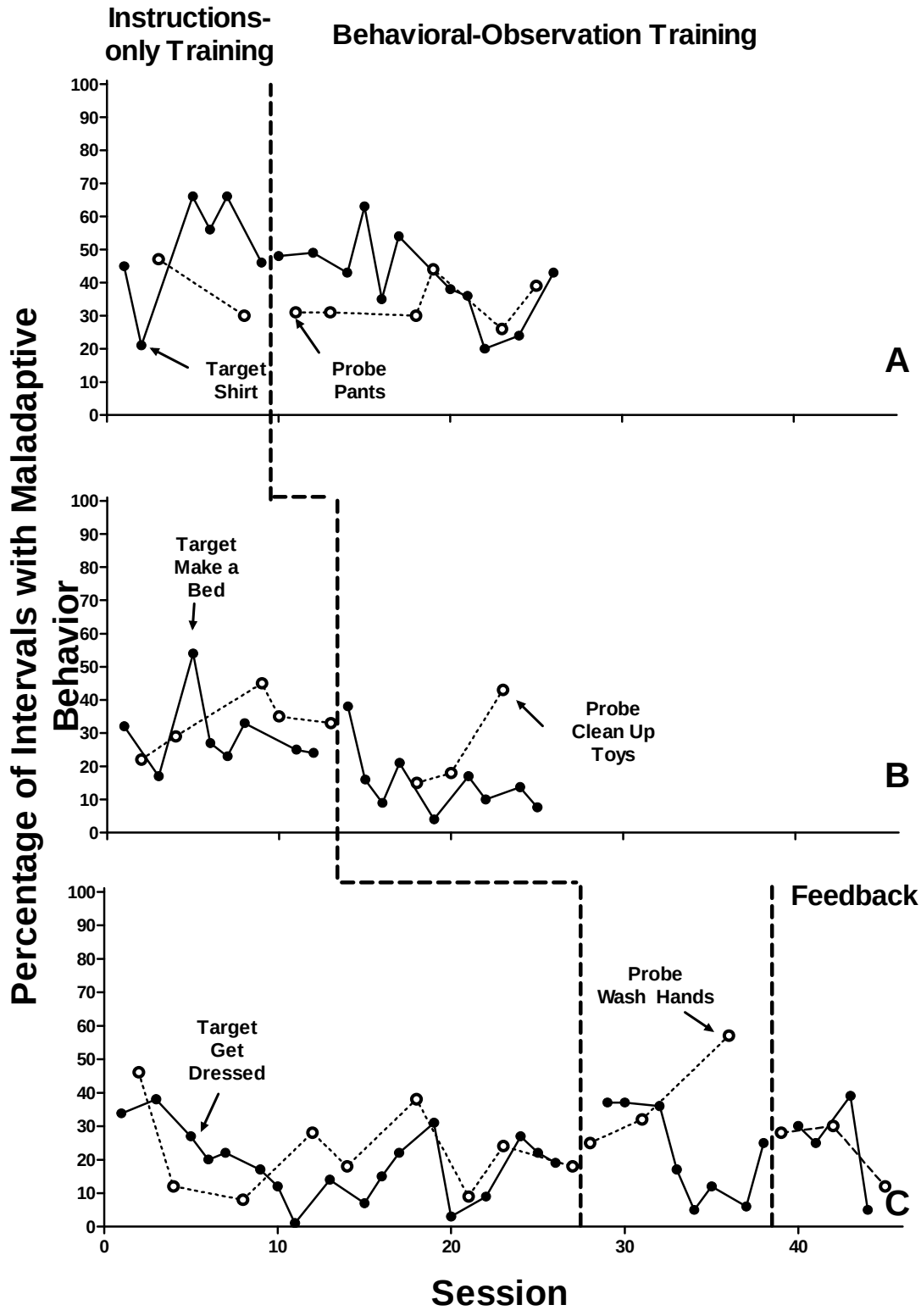

Figure 6. The percentage of sessions with child maladaptive behavior.

Appendix A

Advertisement used to recruit participants

Caregivers and children are wanted for participation in a study on noncompliance. Caregivers will learn to teach their children to follow directions by viewing and scoring video recordings of others teaching children how to follow directions. If your child is frequently noncompliant and you are available to participate 1-2 hours per night, 2-3 nights each week for 3-8 months, please contact

Mike Marroquin at: psychmike22@gmail.com or 917-373-3041.

Appendix B

Guided Compliance Instructions

Please read the following instructions. They will also be read aloud.

1. Call the child by name.

2. Request the target behavior.

3. Wait at least 3 seconds before speaking.

4. If the response occurs, provide response specific praise.

5. If the response did not occur, do not praise. Go to step 6.

6. Call the child by name.

7. Repeat the request the target behavior and

8. Demonstrate the correct response for the child.

9. Say "now you try."

10. Wait at least 3 seconds before speaking.

11. If the response occurs, provide response specific praise.

12. If the response did not occur, do not praise. Go to step 13.

13. Call the child by name.

14. Repeat the request the target behavior and

15. Use hand over hand guidance to complete the response.

16. Do not praise.

If you have any questions please ask.

Appendix C

Parent score sheet sample

The score sheet below was filled out by the caregiver in Dyad A.

Program:_____Least-to-most prompting_____ Dyad A

Parent Score Sheet

Session 10

Date 1/15/12

1	Step Completed
0	Step Not Completed
NA	Step not Necessary

	Trial	1	2	3	4	5
	Video #	20	18	22	23	19
Steps		**Verbal Prompt**				
1	Call the child by name	1	1	1	0	0
2	Request the target behavior.	0	0	0	0	0
3	Wait for at least 3 seconds before speaking	1	1	1	0	1
4	If the response occurs, provide response specific praise.	NA	0	NA	0	0
5	If the response did not occur, do not praise, go to step **6**	1	NA	NA	NA	NA
		Verbal and Model Prompt				
6	Call the child by name	1	NA	1	0	NA
7	Repeat the request for the target behavior and	0	NA	0	0	NA
8	Demonstrate the correct response for the child	0	NA	1	1	NA
9	Say " Now you try"	1	NA	1	0	NA
10	Wait for at least 3 seconds before speaking	1	NA	1	1	NA
11	If the response occurs, provide response specific praise.	1	NA	NA	NA	NA
12	If the response did not occur, do not praise, go to step **13**	NA	NA	1	NA	NA
		Verbal and Physical Prompt				
13	Call the child by name	NA	NA	0	0	NA
14	Repeat the request for the target behavior and	NA	NA	0	0	NA
15	Use hand over hand guidance to complete the response.	NA	NA	1	1	NA
16	Do not praise.	NA	NA	1	0	NA
	% Correct					

Appendix D

Training video order

The training video, chore and order of each session of the behavioral-observation training condition for each dyad.

Dyad	Session	Chore	Video Order
A	10	Shirt	20 18 22 23 19
	11	Pants	18 21 19 20 22
	12	Shirt	23 18 22 20 21
	13	Pants	22 23 20 18 21
	14	Shirt	22 23 21 20 18
	15	Shirt	21 18 19 23 22
	16	Shirt	19 18 23 22 20
	17	Shirt	23 22 18 19 21
	18	Pants	23 21 22 20 19
	19	Pants	21 22 20 23 19
	20	Shirt	22 18 21 20 23
	21	Shirt	22 21 23 20 19
	22	Shirt	20 21 19 22 23
	23	Pants	21 18 23 20 22
	24	Shirt	23 21 18 19 20
	25	Pants	19 21 23 18 19
	26	Shirt	20 18 19 21 23
B	14	Make Bed	2 6 4 5 1
	15	Make Bed	2 5 4 6 1
	16	Make Bed	3 2 6 1 4
	17	Make Bed	3 4 2 5 1
	18	Clean up Toys	8 10 9 11 7
	19	Make Bed	1 4 2 6 5
	20	Clean up Toys	11 12 9 10 8
	21	Make Bed	5 1 4 3 2
	22	Make Bed	6 2 1 5 3
	23	Clean up Toys	7 11 10 9 12
	24	Make Bed	4 3 1 2 6
	25	Make Bed	6 1 5 3 4
C	28	Wash Hands	15 17 13 14 16
	29	Dressing	19 22 23 21 20

30	Dressing	23 20 21 22 19
31	Wash Hands	13 17 14 15 16
32	Dressing	18 20 22 19 23
33	Dressing	18 20 19 21 22
34	Dressing	19 22 23 18 20
35	Dressing	20 22 23 19 21
36	Wash Hands	14 17 15 13 16
37	Dressing	19 18 20 23 21
38	Dressing	21 23 18 19 20

Appendix E

Target and probe session order by dyad.

	Dyad				
Session	**A**	**B**	**C**	**Session**	**C (Continued)**
1	Target	Target	Target	**27**	Probe
2	Target	Probe	Probe	**28**	Probe
3	Probe	Target	Target	**29**	Target
4	Probe	Probe	Probe	**30**	Target
5	Target	Target	Target	**31**	Probe
6	Target	Target	Target	**32**	Target
7	Probe	Target	Target	**33**	Target
8	Target	Target	Probe	**34**	Target
9	Target	Probe	Target	**35**	Target
10	Target	Probe	Target	**36**	Probe
11	Probe	Target	Target	**37**	Target
12	Target	Target	Probe	**38**	Target
13	Probe	Probe	Target	**39**	Probe
14	Target	Target	Probe	**40**	Target
15	Target	Target	Target	**41**	Target
16	Target	Target	Target	**42**	Probe
17	Target	Target	Target	**43**	Target
18	Probe	Probe	Probe	**44**	Probe
19	Probe	Target	Target	**45**	Target
20	Target	Probe	Target		
21	Target	Target	Probe		
22	Target	Target	Target		
23	Probe	Probe	Probe		
24	Target	Target	Target		
25	Probe	Target	Target		
26	Target		Target		

Appendix F

Data sheet used to score child maladaptive behavior.

Dyad _____ Video Name_____

Session _____ Scored by_____

Date _____

	S	B 1	B2	B3	Total
1 Minute	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	
2 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	
3 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	
4 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	

	S	B 1	B2	B3	Total
5 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	
6 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	
7 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	
8 Minutes	10	Y N	Y N	Y N	
	20	Y N	Y N	Y N	
	30	Y N	Y N	Y N	
	40	Y N	Y N	Y N	
	50	Y N	Y N	Y N	
	60	Y N	Y N	Y N	

Appendix G

	Caregiver		
Step	**A**	**B**	**C**
1	97	100	97
2	100	100	96
3	90	95	94
4	90	95	89
5	92	94	83
6	87	86	86
7	88	86	90
8	80	91	90
9	88	91	88
10	88	86	90
11	90	91	95
12	93	92	94
13	93	92	91
14	92	95	94
15	87	98	94
16	93	100	93
Total IOA	91%	93%	91%

IOA data for each step of the LTMPP for all three dyads.

Appendix H
Social validity questionnaire

For each question, please circle the number that best describes your answer.

1. How important to you is your child's ability to follow directions?

1	2	3	4	5
Not Important				Very Important

2. How important to you is learning to teach your child to follow directions?

1	2	3	4	5
Not Important				Very Important

3. How acceptable to you was observing videos of people teaching children to follow directions?

1	2	3	4	5
Not Acceptable				Acceptable

4. How acceptable to you was scoring the videos?

1	2	3	4	5
Not Acceptable				Acceptable

5. How acceptable to you was asking your child to follow a direction?

1	2	3	4	5
Not Acceptable				Acceptable

6. How acceptable to you was showing your child how to follow a direction?

1	2	3	4	5
Not Acceptable				Acceptable

7. How acceptable to you was the procedure of physically guiding your child to follow a direction?

1	2	3	4	5
Not Acceptable				Acceptable

8. How effective was your training at changing your behavior?

1	2	3	4	5
Not Effective				Effective

9. How effective was your training at changing your child's behavior?

1	2	3	4	5
Not Effective				Effective

10. How effective was the overall outcome of the study?

1	2	3	4	5
Not Effective				Effective

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