A PRELIMINARY ANALYSIS OF COMPUTER-BASED TRAINING TO TEACH CLASSROOM BEHAVIOR MANAGEMENT STRATEGIES

By

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Abstract

A PRELIMINARY ANALYSIS OF COMPUTER-BASED TRAINING TO TEACH CLASSROOM BEHAVIOR MANAGEMENT STRATEGIES

RUSINKO, ELIZABETH RUSINKO Ph.D., Department of Applied Behavioral Science, University of Kansas, 2008. Dissertation directed by Professors L. Keith Miller and Greg P. Hanley.

This investigation examined the effects of a computer-based program designed to teach basic classroom behavior management skills to 9 undergraduate students via computer posttests, role-plays, and classroom observations. Posttests across three experiments showed increased knowledge of behavior-management strategies. Although participants in Experiments 1 reached criterion during role-plays on measures of correct responses to inappropriate behavior, participant-delivered requests, and participant-offered choices, most participants consistently delivered requests and provided choices incorrectly. To increase performances during role-plays, Experiment 2 procedures were modified to include videos depicting the correct application of the behavior management strategies. Significant differences were found at posttest for subjects whose training included videos, and percent change from baseline for participant-delivered requests and choices during role-plays increased 233% over baseline. In Experiment 3, we sought to replicate and extend the results to a preschool classroom, and the participant reached criterion for responses to inappropriate behavior at 5 sessions post-computer training.

A Preliminary Analysis of Computer-Based Training to Teach Classroom Behavior Management Strategies

In general, classroom behavior management refers to the manipulation of antecedents and consequences in the classroom setting to increase appropriate academic and social behavior and decrease inappropriate academic and social behavior. Providing choices of activities, materials, or reinforcers are examples of antecedent-based classroom behavior management strategies (e.g., Dyer, Dunlap, & Winterling, 1990; Dunlap et al., 1994; Powell & Nelson, 1997). Reinforcement in the form of praise and tokens, extinction for inappropriate academic behavior such as off-task behavior, and punishment in the form of time-out for inappropriate behavior such as aggression or disruption are all examples of consequence-based classroom behavior management strategies (e.g., Foxx & Shapiro, 1978; Rollins, McCandless, Thompson, & Brassell, 1974; Walker & Buckley, 1972; Webster-Stratton, Reid, & Hammond, 2004).

The importance of developing effective programs to teach classroom behavior management strategies cannot be overstated. For example, the prevalence of problem behavior in early childhood has been estimated at between 3% and 6% in the general population (Huaqing Qi, & Kaiser, 2003) and at an even higher rate of 30% among low-income, preschool children (Feil, Walker, Severson, & Ball, 2000; Gross, Sambrook, & Fogg, 1999). In addition, the *Diagnostic and Statistical Manual of Mental Disorders IV-TR* estimates that 3% to 7% of school-age children suffer from attention-deficit/hyperactivity disorder, between less than 1% to over 10% have met

the criteria for conduct disorder, and approximately 2% to 16% have met the criteria for oppositional defiant disorder (American Psychiatric Association, 2000). Campbell (1995) reported even higher rates, with 10% to 15% of preschool children reportedly engaging in mild to moderate behavior problems. These differences in prevalence rates may be in part due to the methods used to gather these data; most reports were based on adult-completed checklist-type measures (Huaqing Qi & Kaiser, 2003). Additionally, evidence suggests that behavior problems occurring in the preschool years may persist (Campbell & Ewing, 1990) that adolescent boys showing disruptive behavior problems have a history of behavior problems during the preschool years (Moffitt, 1990), and that approximately 50% of preschool children continue to engage in problem behavior into early adolescence (Campbell, 1995).

Clearly the prevalence of problem behavior found in preschool children suggests a need for continued researcher attention to the development of effective programs to teach classroom behavior management strategies. In addition, the successful management of classroom behavior is a prerequisite for learning to occur in the classroom (e.g., Wheldall, 1991). Several studies have reported the effects of poor classroom behavior management on the academic and social success of aggressive or disruptive students and their classmates (Agostin & Bain, 1997; Rollins, McCandless, Thompson, & Brassell, 1974; Walker & Buckley, 1972; Walker, Hops, & Greenwood, 1976; Webster-Stratton, Reid, & Hammond, 2004). Agostin and Bain, for instance, found significant negative correlations between problem behaviors and academic success. That is, the more a child exhibited problem behavior in the

classroom the less likely they were to score well on the Stanford Achievement Test in reading and math. Given that these data are only correlational, additional research, however, is needed to determine if there is a functional relation between problem behavior and achievement test scores.

The prevalence of problem behaviors and the purported effect of problem behavior on academic success thus recognized, it is not difficult to understand the importance of training teachers in behavior-management strategies. Unfortunately, teachers may not have been taught effective classroom behavior management strategies prior to entering the classroom. For example, Public Agenda (2004), a nonpartisan and nonprofit organization, reported that teachers often enter schools without training in basic classroom behavior management. These results were based on a nationwide random sample of a survey of 725 middle and high school teachers' responses to questions regarding issues such as discipline, causes of problem behavior, and the effectiveness of discipline policies. Furthermore, the authors reported that based on the problem behaviors (e.g., cheating, arriving late, bullying) occurring in their classrooms, 34% of teachers had considered quitting or know a colleague who has quit. Finally, 85% of those interviewed reported that new teachers are unprepared to manage problem behaviors.

Fortunately, a growing body of research on classroom behavior management provides some evidence that teachers can be trained to effectively manage classroom behavior through the manipulation of antecedents and consequences in the classroom setting. Researchers have investigated a variety of classroom behavior management

programs, for example, teaching teachers to implement basic behavior-management strategies based on the principles of behavior (e.g., Greer, 1997; Rollins et al., 1974; Walker & Buckley, 1972; Walker et al., 1976; Webster-Stratton et al., 2004), the use of various forms of token systems (e.g., Barrera et al., 2002; Bishop, Rosen, Miller, Hendrickson, 1996), group contingencies (e.g., Harris & Sherman, 1973; Kellam et al., 2008), and school-based check in systems (e.g., Hawken & Horner, 2003; Todd, Campbell, Meyer, & Horner, 2008)**.** Training has typically consisted of various combinations of written and vocal instructions, modeling, and positive and corrective feedback. Evaluations of these programs have been conducted via single subject and experimental versus control group methodologies (e.g., Kellam et al., 2008; Todd et al., 2008)

For example, Greer (1997) examined the effect of the Comprehensive Application of Behavior Analysis to Schooling (CABAS) on students' educational gains. CABAS is a school-wide approach that focuses on curriculum design and teaching methods, along with training teachers in classroom behavior management based on the principles of behavior. In general, teachers are provided information covering basic principles of behavior in written and lecture form, trained in the classroom via modeling of student programs, and provided immediate positive and corrective feedback. Results spanning fifteen years of application revealed that CABAS students made greater educational gains than non-CABAS students (Greer, 1997). Similarly, Rollins et al. (1974) found that teachers who were trained in basic behavioral principles successfully managed students' classroom behaviors. That is,

teachers consistently reinforced appropriate behaviors via praise and a token system (antecedent-based intervention), which resulted in an increase in desired behaviors (e.g., attention to academic tasks) and a decrease in undesired behaviors (e.g., inappropriate social conversations with peers).

The Good Behavior Game (GBG) is a behavior-management strategy that utilizes group contingencies for reducing problem behaviors in the classroom (Barrish, Saunders, & Wolf, 1969). Briefly, the teacher divides the class into teams that contain equal numbers of boys and girls with equal numbers of children with behavior problems and children without behavior problems. Classroom rules concerning appropriate behaviors (e.g., working quietly) and inappropriate behaviors (e.g., fighting) are explained. An interdependent group contingency is typically used in which teams receive check marks when any member of the team engages in inappropriate behavior (Litow & Pumroy, 1975). That is, all members of the group, individually and as a group, must meet the criterion to avoid receiving a check mark. Teams that receive fewer or equal to a predetermined amount of checks earn rewards such as stickers or classroom activities. The GBG is played for ten minutes three times a week at first and then gradually incorporated into the entire day (Coalition for Evidence-Based Policy, n. d.).

Kellam et al. (2008) investigated the long-term effect of a two-year long implementation of the GBG on 238 first-graders who were randomly assigned to eight classrooms that were similar in academic and behavioral performance as compared to 169 children assigned to six classrooms (similar in academic and

behavioral performance) who did not receive the GBG (i.e., the control group). Measures of behavioral, social, and psychiatric outcomes were conducted when participants reached young adulthood (ages 19-21). Significant results were found for males who had exhibited aggressive and disruptive behavior in first grade. In general, they showed reduced alcohol and drug dependence or abuse, were less likely to smoke, showed lower rates of antisocial personality disorder, and showed slightly lower rates of major depressive disorder as compared to the control group based on information collected during a 90-minute telephone interview. These results suggest that classroom behavior management can have not only immediate effects such as decreased inappropriate conversations and increased time on-task (e.g., Rollins et al., 1974), but also long-term effects particularly for males who exhibit aggressive and disruptive behavior in first grade. However, these data are based on the results of indirect measures (interviews) and therefore should be interpreted with caution.

Todd et al. (2008) examined the use of a check-in system on the noncompliant and disruptive behavior of four elementary-age boys (i.e., kindergarten, first, second, and third grade). The check-in–check-out program (CICO) was comprised of three pre-designated times during the school day in which children received adult feedback concerning their behavior and the opportunity to earn points based on the adults' assessment of the participants' behavior. Points could be traded during the day for rewards such as tangible items (stickers, pencils), time with an adult or peer, or extra recess time. In addition, a report was sent home each day that summarized the child's behavior in terms of points earned, praise received, and specific behaviors identified

for the child to work on. Then on the following day, the children brought the card back with a parent's signature. Teacher interviews and direct observations of each boy indicated that the majority of problem behaviors were maintained by adult attention. The multiple baseline design across participants showed problem behavior was high and variable during baseline. Following the implementation of CICO, the percentage of 10-s intervals during 20-min observations with problem behavior for all participants showed a decrease in level and variability in the percentage of intervals with problem behavior (e.g., talking out, noncompliance). In general, there was a mean reduction in problem behavior of 17.5%; however, it is unclear if this reduction was clinically significant.

Although the research provides evidence for the effectiveness of the use of these approaches to decrease inappropriate behaviors such as noncompliance and increase appropriate behaviors such as attention to academic tasks, some limitations in the generality of these results remain (e.g., Rollins et al., 1974; Todd et al., 2008). For example, approaches such as CABAS (Greer, 1997) require a system-wide adaptation and intensive ongoing consultation that some schools may not be willing or able to commit to. The use of group contingencies has effectively reduced aggression and disruption in general, but this approach may also increase the likelihood of unwanted behaviors such as bullying and sabotage (e.g., Harris & Sherman, 1973; Kellam et al., 2008). In addition, some children may just simply refuse to participate. However, Harris and Sherman effectively addressed the use of sabotage and refusal to participate in the GBG in a fifth-grade classroom by creating a

third group comprised of the children that had refused to participate appropriately; problem behavior within this group decreased by the following day. Also, although check-in systems are relatively easy to implement, Todd et al. (2008) reported some difficulty in getting parents to sign a daily report summarizing their child's classroom behavior. In addition, only attention-maintained behaviors were addressed during this study. Also, our review of the literature revealed that the majority of research on classroom behavior management has been conducted at the elementary and high school level. Finally, and perhaps most importantly, the majority of interventions were implemented after problem behavior developed.

Given the prevalence of problem behaviors in preschool children and the evidence that behavior problems occurring in the preschool years may persist, along with the paucity of research on classroom behavior management at the preschool level, the development of effective teacher training in classroom behavior management for preschool teachers is warranted (Campbell, 1995; Campbell & Ewing, 1990; Feil et al., 2000; Gross et al., 1999; Huaqing Qi, & Kaiser, 2003). Addressing problem behavior in the classroom at the start of children's educational careers may help to decrease the likelihood of the development of problem behaviors. As mentioned above, teacher training in classroom behavior management has typically consisted of various combinations of written and vocal instructions, modeling, and positive and corrective feedback. However, the increase in the use of computers to train teachers in areas such as instructional design and teachers' use of parents' names suggests that computer-based training may be a viable approach to

training teachers to implement classroom behavior management strategies (Hoogveld, Paas, Jochems, & van Merrienboer, 2001; Ingvarsson & Hanley, 2006).

Specifically, computer-based teacher training would provide relatively easy access to training for all teachers while perhaps minimizing the need for continued consultation, could address all functions of behavior, and could be implemented before behavior becomes problematic. Additional advantages may include increasing cost effectiveness by eliminating the need for an expert to provide the training because an expert who leaves the setting who will most likely take their expertise with them whereas a computer-based training program would be readily available (Greer, 1997). Moreover, computer-based training can be completed at a time convenient to the learner; it is also self-paced, and immediate performance feedback can be provided.

Although our review of the literature did not find any previous investigations of the use of computer-based training to teach classroom behavior management, computer-based training that incorporates the principles of both programmed instruction and personalized instruction to teach classroom behavior management at the preschool level, the use of this type of instruction may be a viable approach to training (Keller, 1968; Skinner, 1968). Programmed instruction involves dividing skills into their subcategories and requires that each component is taught to mastery using prompting that is gradually and systematically faded before proceeding to the next step. It also involves the immediate delivery of positive reinforcement for correct responses and corrective feedback for incorrect responses. Such an approach has

shown more rapid acquisition of information as compared to typical instruction (e.g., lectures; Fernald & Jordan, 1991; Kulik, Kulik, & Cohen, 1980). An instructional program that is similar to programmed instruction is personalized instruction, which is self-paced and requires mastery of the current material before moving to the next step within the program (Keller, 1968). Semb's (1974) investigation of the effects of mastery criteria on college-student test performance showed that a high mastery criterion, 100% correct, was superior to setting a low mastery criterion, 60% correct or better, in producing successful test-taking performance. In addition, the author's review of the literature, which compared performances on examinations following traditional lecture procedures to personalized instruction procedures, revealed that the latter produced superior performances. These results suggest that a computer-based teacher training program that utilizes programmed and personalized instruction and sets a high mastery criterion may not only be effective, but may help to eliminate the need for lectures and workshops, which in turn might decrease the amount of time needed for training.

The purpose of the following investigation was to assess the effectiveness of a computer-based training program that incorporated the principles of programmed instruction (with the exception that prompts were not gradually and systematically faded) and personalized instruction to teach basic classroom behavior management strategies for teachers in a preschool setting. These behavior-management strategies were identified as desired teacher behaviors and were separated into two categories: proactive and reactive strategies. Proactive strategies focus on antecedents in the

classroom that may help maintain desirable behavior and prevent problem behavior. Some examples of proactive strategies are providing children with a choice of activities and teacher attention throughout the preschool day contingent on desirable behavior (Golonka, Wacker, Berg, Derby, Harding, & Peck, 2000; Umbreit & Blair, 1996). Reactive strategies focus on the consequences that may be maintaining problem behavior. Some examples are delivering a reprimand and the removal of a child from an activity while remaining in view of the desired activity (Foxx & Shapiro, 1978; O'Leary, Kaufman, Kass, & Drabman, 1970; Reynolds & Kelley, 1997). Also, although feedback was incorporated into the training program, it was not part of the computer-based training and as such should be viewed as a remedial procedure. That is, our purpose was to design a computer-based program that would successfully train teachers in classroom behavior management strategies, thereby eliminating the need for additional training. However, based on the large body of research suggesting that training without the inclusion of feedback is typically not effective, we incorporated feedback procedures in the event that feedback might be necessary (e.g., Codding, Feinberg, Dunn, & Pace, 2005; Demchak, 1987; Ingvarsson & Hanley, 2006; Quilitch, 1975; Roscoe, Fisher, Glover, & Volkert, 2006).

The present investigation assessed the effectiveness of teaching undergraduate students classroom behavior management strategies via a computer-based training program across three experiments. In Experiment 1, we examined the effect of a computer-based training program, the content of which was based on the behavior-management section of the Edna A. Hill Child Development Center preschool teacher

manual. Pre-posttest questions covering typical teacher-child preschool classroom interactions were designed to test knowledge of the material presented during the computer training. Scripted role-plays simulating typical child behaviors that occur in preschools were conducted (the experimenter played the role of the child, and the participant played the role of the teacher) to assess participants' application of the behavior-management strategies.

In Experiment 2, we assessed the effect of the addition of videos to the computer-based training program on participants' performances on the computer training posttest and participants' performances during role-plays. Our choice to incorporate videos was based on the following considerations. First, despite the clear increase in participants' knowledge of classroom behavior management strategies following the computer training, all participants made similar and consistent mistakes during the role-plays (e.g., framing requests and choices incorrectly). Furthermore, feedback in the form of behavior-specific descriptions and modeling was necessary for participants to reach criterion. These results are consistent with previous research that has shown that, although participants may acquire the necessary verbal behavior (i.e., staff can talk about the information), they may not always effectively apply the information (Reid, Parsons, & Green 1989; Sepler & Myers, 1978). Based on our data and previous research findings, we decided to add models of the specific strategies to the training program that participants in Experiment 1 showed difficulty in acquiring. Second, a wide variety of training packages that incorporated the use of videotape modeling have been shown to be an effective approach to training across various

skills, for example, increasing teachers' knowledge of sexual abuse (e.g., Kleemeier, Webb, Hazzard, & Pohl, 1988), teaching parents of young adults with disabilities to improve their child's purchasing skills (e.g., DiPipi-Hoy & Jitendra, 2004), and staff's acquisition of functional analysis skills (e.g., Moore & Fisher, 2007). Third, as the purpose of the current investigation was to assess the effect of a computer-based training program, we chose to incorporate videos, so all training methods remained within the computer-based training program. Therefore, based on the findings of Experiment 1, computer training was modified in Experiment 2 in an attempt to increase the participants' knowledge of the behavior-management strategies at posttest and correct application of the behavior-management strategies during scripted role-plays. Specifically, videos depicting the correct application of the behavior-management strategies were embedded within the computer training and were assessed via the computer training posttest and during role-plays.

In Experiment 3, we sought to investigate the effect of the computer-based training on 1 participant's application of the behavior-management strategies in a preschool classroom. Upon completion of the computer-based training, the participant was observed in the preschool classroom interacting with two children during a play situation.

EXPERIMENT 1

Method

Participants, Setting, and Materials

Participants were four female undergraduate students enrolled in an introduction

to behavior analysis course. Computer training was conducted in an office containing two desks, bookshelves, and a computer. Scripted role-plays were conducted in a session room designed to emulate classroom-teaching conditions. It contained a child-size table, two child-size chairs, and common preschool toys along with a video camera for data collection and a one-way mirror (not used in the study). Both the computer training and scripted role-plays were conducted in a university building.

Digital Teacher 4.21 (Francis Software Inc., 1998) was used to design and present the material, record responses, and deliver feedback. *Digital Teacher* is a commercially available set of software applications that enables users to design instructional or testing materials that incorporates the delivery of the material, immediate corrective feedback, and automatic data collection. This program can be used either off-line or on-line and can allow access to the instructional materials via the Internet. The content of the computer-based training was based on the behavior-management section of the Edna A. Hill Child Development Center preschool teacher manual (Appendix C) located at the University of Kansas. Multiple-choice and fill-in-the-blank questions were embedded within the text to enhance reading comprehension. Assessment of the computer-based training consisted of two pre-posttest sections comprised of a total of 36 multiple-choice and fill-in-the-blank questions (see Appendix A and B) based on the information found in the behavior-management section of the university's preschool training manual. Questions represented typical teacher-child preschool classroom interactions that occur in a preschool classroom and were developed based on interviews with teachers from the

university's preschool classroom. Scripted role-plays were used to assess mastery of the skills taught via the computer program.

Response Measurement and Interobserver Agreement

Digital Teacher 4.21 (Francis Software Inc., 1998) recorded participants' responses during the computer-based training program. Observers viewed videotapes of the role-plays and scored participants' responses as correct or incorrect based on their occurrence or nonoccurrence during the scripted role-plays. For example, the delivery of an antecedent such as providing a choice (a proactive strategy) was scored as correct if it occurred at the appropriate time (e.g., in the absence of problem behavior) or incorrect if it did not occur at the appropriate time (e.g., following problem behavior), was framed incorrectly (e.g., "What do you want to do?" versus labeling the available activities), or was omitted. The delivery of a consequence such as ignoring a problem behavior (a reactive strategy) and continuing with the activity was scored as correct if it occurred within 5 s following the problem behavior and incorrect if it did not occur. Sessions lasted 5 min.

In all conditions, two trained observers independently viewed the videotapes and recorded participant behavior during at least 25% of scripted sessions. Interobserver agreement was calculated on an interval-by-interval basis. Percentage agreement scores were calculated by dividing the number of agreements by the number of agreements plus disagreements, multiplied by 100%. Mean agreement across participants was 91% (range, 84% to 100%).

Procedure

Overview. Experiment 1 assessed the effectiveness of a computer-based training program on the application of classroom behavior management strategies during computer training and role-plays. Baseline data were collected on participants' application of behavior-management strategies via scripted role-plays of typical teacher-child preschool classroom interactions in which the experimenter played the role of the child and the participant played the role of the teacher**.** The experimenter followed a script that presented the type of child behavior the adult should engage in and the time that it should occur. Data were collected on the participants' responses to appropriate and inappropriate child behavior. Participants then completed the computer-based training followed by additional scripted role-plays of typical teacher-child preschool classroom interactions. Based on both problem and desirable behaviors derived from the behavior-management section of a university preschool manual (see Appendix D), five scripts were used to assess participants' application of the material presented in the training. Scripts consisted of similar behaviors presented in different order to control for script effects such as memorizing. Script choice was based on the previous condition; for example, if script 3 were the previous script, then script 4 was selected next for Experiment 1. Experiment 2 script choices were also based on the previous session but, in addition, all remaining scripts were chosen one at a time "from a hat." Scripts were put back in the "hat" only after all five scripts were chosen. This process was repeated until the participant met criteria

Scripted simulations. During scripted simulations, the researcher and participant were seated at a table in a session room with all relevant materials

available. Prior to each scripted role-play, the researcher read the following scripted instructions to the participant: “We are going to be in the room for 5 minutes. While we are in the room, I am going to be the preschooler and you will be the teacher. You may use the preschool materials however you would like, but, during this time, I would like you to instruct me to do two different things and offer a choice of activities two separate times. This can be done at any time during the session.”

Each scripted role-play consisted of 20 opportunities for the participant to respond to both appropriate and inappropriate behaviors that typically occur in preschool classrooms and also to deliver 4 prompts (i.e., 2 requests and offer 2 choices) to the “child.” Specifically, the researcher, acting as a typical preschooler, engaged in 8 appropriate behaviors (i.e., 2 requests for items, 2 requests for help, 2 appropriate vocalizations, and play or work independently 2 times) and 8 inappropriate behaviors (i.e., 3 inappropriate vocalizations, 3 motor disruptions (e.g., throwing an item), and 2 aggressions (e.g., kicking the participant’s chair). Thus, the participant had 20 opportunities to respond either proactively or reactively to the “child’s” behavior during each 5-min scripted assessment.

Feedback was delivered to participants who did not reach 100% criterion within three sessions following the computer training. Based on participants’ most recent performance during role-plays, feedback was delivered immediately preceding the next scripted assessment and consisted of praise for correct responses and vocal descriptions of incorrect responses. Feedback also included descriptions of and rationales for the correct response. Data collectors scored, via videotapes,

participants' responses to the scripted "child" behaviors and participant-delivered requests and choices.

Computer program. Following the baseline scripted assessments, participants completed the computer-based training program, which presented basic proactive and reactive strategies used in the university's preschool classroom. *Digital Teacher 4.21* (Francis Software Inc., 1998) was used to design and implement the intervention. Instructions on how to move through the program were provided on the first page of the training. The participants were informed that if they did not know an answer during the pre-posttest sections they could either guess or press 'enter" to advance to the next question. Similarly, if participants did not know an answer during the training section they were told that they could guess or press "enter". If they answered incorrectly the correct answer would be provided. The entry of the correct answer was required to advance to the question or page. The experimenter answered all questions regarding the operation of the computer-training program. Hints or answers to questions regarding the material presented within the training were not provided. Constructed responding was required throughout the computer training. This requirement was based on research that suggests that typing words or phrases (active constructed responding) versus clicking on a stimulus with a mouse (less active responding) results in quicker acquisition of the material and more robust maintenance and generalization (Kritch & Bostow, 1998: Tudor, 1995; Tudor & Bostow, 1991).

The computer-based training program was divided into five sections. The first

two sections consisted of two pretests designed to assess the effect of the training on participants' application of the university preschool's behavior-management strategies. The pretests were based on typical teacher-child preschool classroom interactions and were designed to test participants' knowledge of the behavior management section of the university's preschool teacher's manual. Brief scenarios describing typical child classroom behavior and teacher behavior and the context in which it occurred were presented. Scenarios were followed by either fill-in-the-blank or multiple-choice questions concerning the best teacher response that would either increase appropriate child behavior (i.e., proactive strategy) or decrease inappropriate child behavior (i.e., reactive strategy) based on information provided within the scenario. Scenarios were comprised of either appropriate child behaviors (i.e., requesting help, requesting an item, playing or working appropriately, and appropriate vocalizations), inappropriate child behaviors (i.e., motor disruptions, inappropriate verbalizations, and aggression), or teacher prompts (i.e., teacher offered choices and teacher delivered requests for appropriate child behavior). Section one was comprised of a 12-item multiple-choice and fill-in-the-blank (i.e., 6 scenarios containing appropriate child behaviors, 4 scenarios containing inappropriate child behaviors, and 4 scenarios containing teacher prompts that consisted of 1 teacher delivered request and 1 teacher provided choice) to test for generalization. Section two presented 24 multiple-choice and fill-in-the-blank questions (i.e., 12 scenarios containing appropriate child behavior, 7 scenarios containing inappropriate child behavior, and 5 scenarios containing teacher delivered prompts which consisted of 2

teacher-delivered requests and 3 teacher-provided choices) that were used for teaching. Performance feedback was not provided.

Section three presented the training portion of the computer program the content of which was based on the Edna Hill Child Development Center's preschool teacher manual and was divided into seven subsections: the introduction, two proactive-strategy subsections, three reactive-strategy subsections, and one summary subsection**.** The training was comprised of definitions and examples of and rationales for the use of proactive and reactive behavior-management strategies in the classroom. Multiple-choice and fill-in-the-blank questions were embedded within each section to test reading comprehension. If an incorrect response occurred during section 3, immediate corrective feedback (i.e., the answer) was provided. Mastery criterion was set at 100%. That is, participants were required to achieve 100% correct responding in each subsection in order to access subsequent subsections. If an incorrect response occurred the participant repeated the question until the correct response was elicited. The last two sections were comprised of posttests. In section four, participants repeated the 24-item teaching posttest. If an incorrect response occurred, immediate corrective feedback (i.e., the correct answer) was provided. Again, 100% mastery was required. That is, if one or more responses were incorrect, the participant repeated the section until all 24 questions were answered correctly. Section five was comprised of a 12-item generalization posttest. Performance feedback was not provided, and mastery was not required.

Experimental Design

The effect of the computer-based training program was evaluated using a multiple baseline design across participants.

User Satisfaction

Participants responded to five items that asked them to rate their satisfaction with the program and willingness to recommend the program using a Likert-scale where a score of 1 indicated the participant strongly agreed and a 7 indicated the participant strongly disagreed.

Results and Discussion

Figure 1 depicts the participants' pre- posttest performances on the computer-based training program across three categories of typical teacher-child preschool classroom interactions: child appropriate (A), child inappropriate (I), and teacher prompt (P). The top panel shows the results of the teaching test in which participants repeated the 24-item test until mastery criterion was met (100% correct). Pretest scores showed a low level of correct responses across all categories (M = 28.6%) with the exception of Tanya and Connie who both scored 83% correct on A questions at pretest. Since the program required participants to meet the 100% correct criterion before advancing to the generalization posttest, and since all participants met this criterion, and since the participants' first attempt at the teaching posttest provides the clearest indication of participants' initial knowledge of the material, only the first-attempt scores on the teaching posttest will be reported here. Tanya's first-attempt scores were lost due to a technical difficulty within the Digital Teacher program; therefore, only Jackie, Ellen, and Connie's first-attempt scores were reported. Hash

marks depict each participant's first attempt, and the absence of a hash mark represents 100% correct on the first attempt. The participants' first-attempt scores on the posttest were on average 97% correct (range, 91.6 % to 100%) on A questions, 95.3% correct (range, 85.7% to 100%) on I questions, and 40% correct on P questions.

The bottom panel in Figure 1 presents the results of the 12–item generalization test. Pretest scores showed a low level of correct responding across all categories for all participants (M = 18%). Overall, posttest scores were either at or above 75% correct for all participants. Furthermore, all participants scored 100% on P questions. Tanya's posttest scores revealed an increase in correct responses for A (100%) and I (83%) questions. Jackie also showed improvement at posttest, scoring 75% and 100% correct on A and I questions, respectively. Posttest scores for Ellen were similar for A (75% correct) questions, although she scored lower (67% correct) on I questions. Connie's scores showed the least improvement 50% correct on A questions and 67 % correct on I questions.

Figure 2 presents the percentage of correct responses to appropriate and inappropriate child behavior and correct participant delivered prompts (i.e., choices and requests) during scripted role-plays for all participants. Correct response to appropriate child behavior was at or near 100% in baseline and post training for all participants and therefore will not be reported graphically. Baseline data show an overall low level of correct responses to inappropriate child behavior and participant delivered prompts (i.e., offering choices and delivering requests) across all

participants (*Ms* = 17% and 25%, respectively). Post training data were variable within and across participants. Tanya showed an immediate increase in correct responses to inappropriate behavior (*M* = 69%) at post computer training. However, correct delivery of prompts showed a slight increase in the first session post training followed by a decrease to baseline levels. Jackie's first session post training revealed a dramatic decrease in correct responding (i.e., 0%) to inappropriate behavior and subsequently remained at baseline levels. Although, a slight increase in correct delivery of prompts occurred and remained stable at post training (*M* = 50%), Ellen's data showed an immediate increase in correct responses to inappropriate behavior and a variable increase (some points at baseline levels) in correct delivery of prompts following computer training. Connie's post-training data revealed an immediate and large increase in correct response to inappropriate behavior followed by a decrease to near baseline levels. In addition, correct delivery of choices and requests remained at baseline levels. All participants achieved criterion performance, that is, 100% correct responding across 20 opportunities (i.e., eight appropriate, eight inappropriate, four prompts comprised of offering two choices and delivering two requests) within 4 sessions following the introduction of researcher-delivered feedback with the exception of Ellen; she reached criterion within 11 sessions. The number of sessions to reach criterion ranged from 6 (Tanya) to 13 (Ellen).

Table 1 shows the participants' ratings of the computer-based training program. Of the two returned questionnaires, they agreed overall that they enjoyed learning via the computer-based training program and that they were more confident

in their ability to increase desirable behavior and decrease problem behavior after completing the training. One participant agreed that she would use the strategies in a preschool classroom and strongly agreed that she would recommend and use the computer-based training program to train preschool teachers.

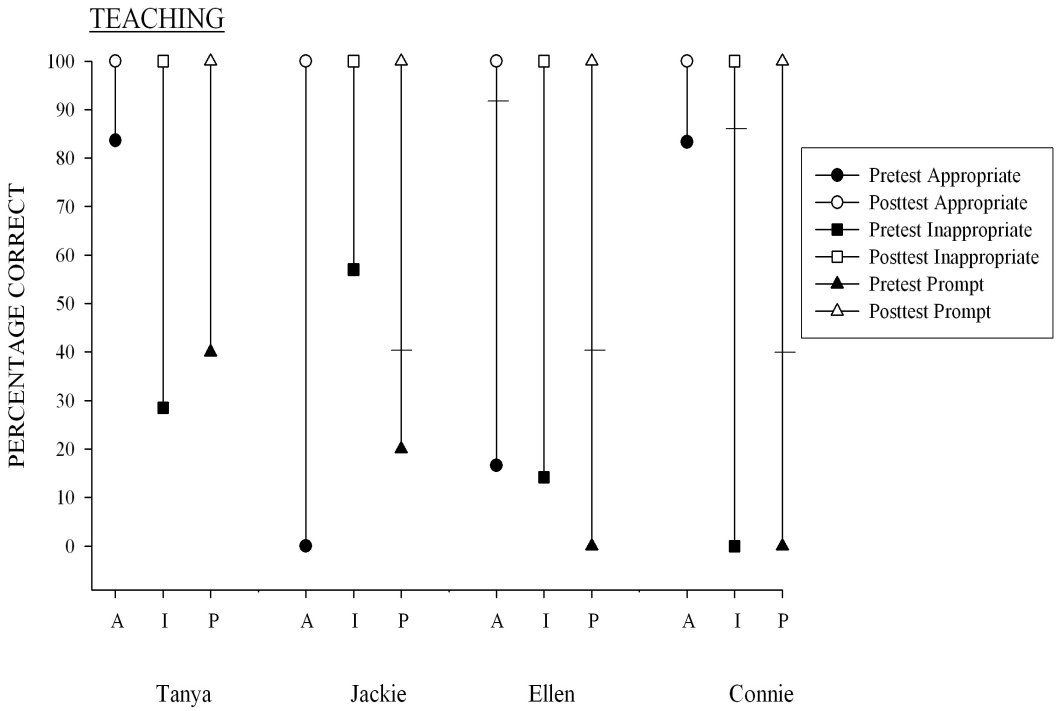
In sum, Experiment 1 data revealed the following information. First, participants had the skills in their repertoire to respond correctly to appropriate child behavior during role-plays prior to the computer training. Second, all participants reached criterion on the computer-based training teaching posttest. In fact, first attempt scores were on average 77% correct across all three categories. Third, participants scored on average 84% correct on the 12-item generalization posttest across all three categories (appropriate (A) and inappropriate (I) child behavior and prompts (P)). Last, all participants met criterion within five sessions following the introduction of feedback. Together, the results of Experiment 1 demonstrate the effectiveness of the computer-based training program to increase participants' knowledge and correct application of classroom behavior management strategies.

Despite the clear increase in participants' knowledge of classroom behavior management strategies following the computer training, we sought to improve the training program by addressing the following concerns that arose during Experiment 1. First, during scripted role-plays, participants consistently framed requests in the form of a question or suggestion rather than a directive (e.g., "Why don't you sit down?" versus "sit down"). Framing requests in the form of a question or suggestion rather than a directive allows the child the opportunity to appropriately refuse to

complete the request. Participants also consistently offered choices without labeling the available choices (e.g., "What do you what to do?" versus "Do you want to play blocks or draw a picture?") and delivered these prompts (i.e., participant-delivered requests and participant-offered choices) at the wrong time (e.g., following problem behavior). Omitting the label allows the child the opportunity to choose an unavailable activity, which may, in turn, lead to problem behavior. Lastly, providing a choice following problem behavior may simply reinforce the problem behavior.

Second, the use of proactive strategies such as stating classroom rules (e.g., Only teachers touch doors.) consistently followed inappropriate behavior while access to the current desired tangible, activity, or attention was not delayed. Delayed access to a reinforcer following inappropriate behavior may reduce the likelihood that the inappropriate behavior will continue. For example, stating rules might be a form of attention, which may in turn function as a reinforcer for child problem behavior resulting in an increase in problem behavior. Or children may learn to ignore the teacher and continue to engage in problem behavior if the contingent removal of or delayed access to a reinforcer does not follow the unwanted behavior. Third, feedback in the form of behavior-specific descriptions and modeling was necessary for participants to reach criterion. Similar to these findings, research has shown that although participants may acquire the necessary verbal behavior (i.e., staff can talk about the information), they may not always effectively apply the information (Reid, Parsons, & Green 1989; Sepler & Myers, 1978). In an effort to increase participants' performance on the computer-training posttest and application of the proactive and

reactive strategies during scripted role-plays during Experiment 2, we decided to add models of the specific strategies that participants in Experiment 1 showed difficulty in acquiring. Therefore, in Experiment 2, we incorporated modeling within the computer training via videos demonstrating the correct vocal and physical response to appropriate and inappropriate child behavior in an effort to increase correct responding during the computer program and role-plays. Furthermore, as noted previously, the purpose of the current investigation was to assess the effect of a computer-based training program we chose to incorporate videos so all training methods remained within the computer-based training program. Fourth, and lastly, because the main purpose of this line of research was to analyze the effect of a computer-based training program on the implementation of classroom behavior management strategies, we replaced feedback in Experiment 2 with a second computer training session.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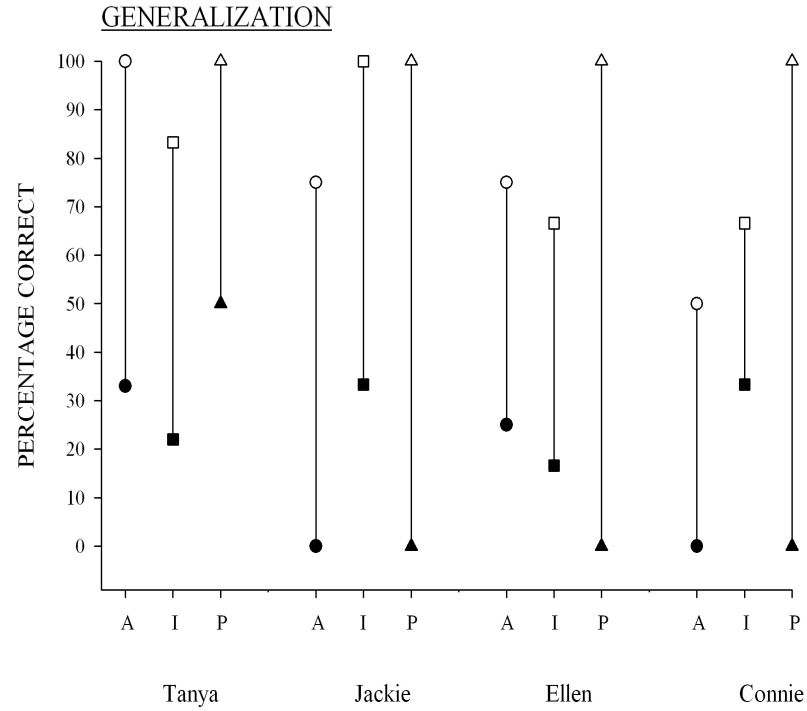
A I P A I P A I P A I P
Tanya
Jackie
Ellen
Connie
Pretest Appropriate
Posttest Appropriate
Pretest Inappropriate
Posttest Inappropriate
Pretest Prompt
Posttest Prompt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Tanya
Jackie
Ellen
Connie

Figure 1. Performances on the computer-based training program across three categories of typical teacher-child interactions: abbreviations are A for child appropriate, I for child inappropriate, and P for teacher prompt. Hash marks indicate first attempt scores during the teaching posttest (top panel only).

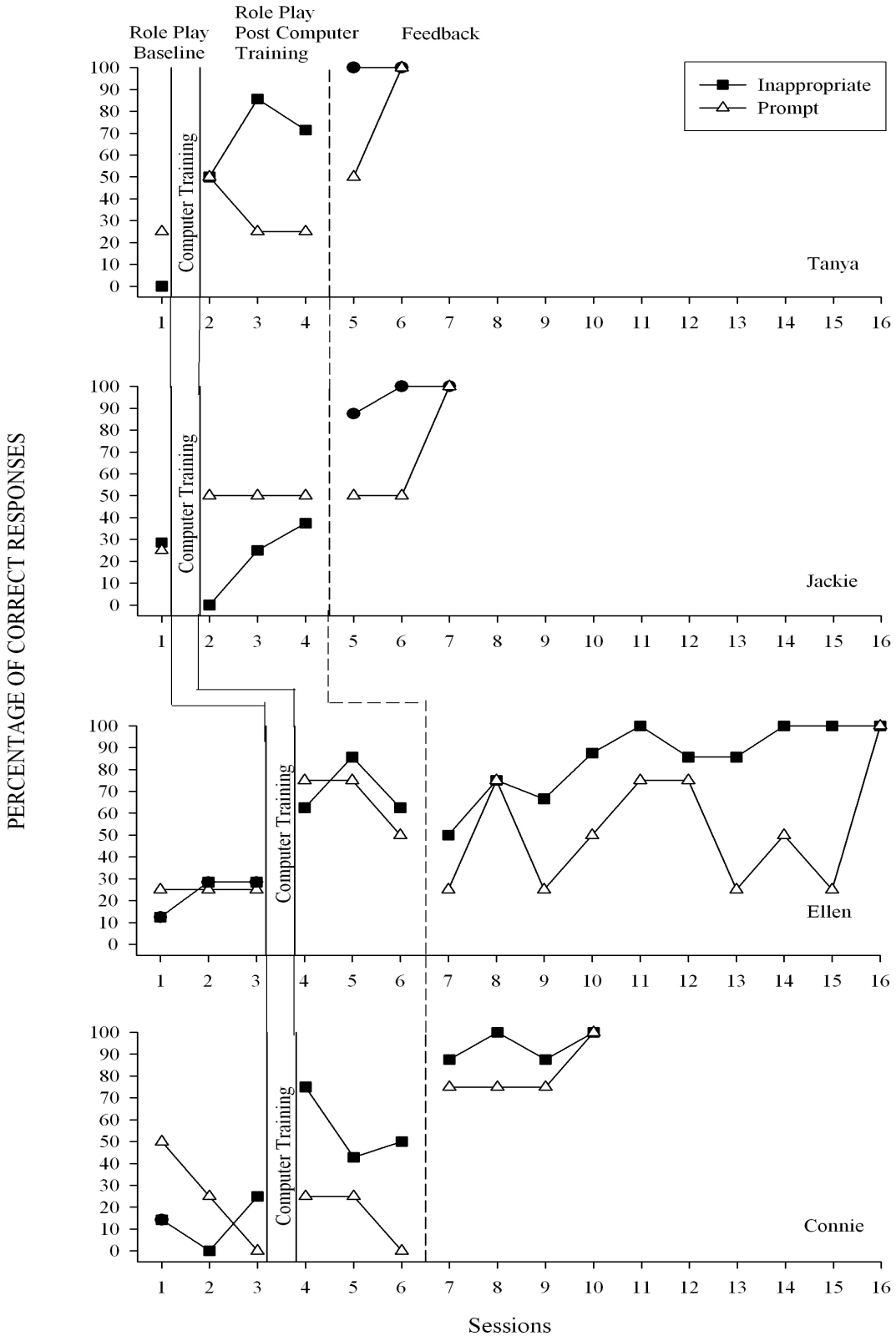

Role Play
Baseline
Role Play
Post Computer
Training
Feedback
Computer Training
Inappropriate
Prompt
Tanya
Jackie
Ellen
Connie
PERCENTAGE OF CORRECT RESPONSES
Sessions

Figure 2. Percentage of correct responses to inappropriate child behavior and correct participant-delivered prompts (i.e., choices and requests) during scripted role-plays for Experiment 1 participants.

Table 1

Participant Ratings of the Computer-Based Training Program Without Videos

Survey item	1	2	3	4	5	6	7
1. I enjoyed learning via the computer-based training program.		2					
2. After completing the computer-based training program, I am more confident that I can increase desirable behavior and decrease problem behavior in the preschool classroom.	1	1					
3. I would use the proactive and reactive strategies described in the computer program in a preschool classroom.		1	1				
4. I would recommend this computer-based training program to preschool teachers.	1		1				
5. I would use this computer-based training program to train preschool teachers.	1		1				

1 = Strongly Agree, 7 = Strongly Disagree

The above data represents a total of two returned questionnaires.

EXPERIMENT 2

Method

Participants, Setting, and Materials

Participants were 4 undergraduate students (3 female and 1 male) enrolled in an introduction to behavior analysis course. Except for some minor changes to the training material based on feedback (e.g., typos and the need for clarification of some of the writing) from participants in Experiment 1 and the addition of videos to the computer–based training program, the setting and materials were the same as in Experiment 1. The decision to add videos to the computer-based training was based on an analysis of Experiment 1 participants' performance during role-plays which revealed an overall low level of correct responses across the following categories: prompts (i.e., participant delivered requests and offering of choices), sit and watch (i.e., time out), ignoring problem behavior when an instruction had not been delivered, and ignoring problem behavior when an instruction had been delivered and then implementing three-step prompting (i.e., moving progressively from a vocal prompt, to a model prompt, to a physical prompt contingent on correct responding; Tarbox, Wallace, Penrod, & Tarbox, 2007) to ensure the child completes the participant-delivered instruction. Based on these results, 17 videos of typical teacher-child preschool classroom interactions depicting the correct response during the aforementioned categories were embedded in the computer-based training program. Each video presented two adults portraying typical teacher-child preschool classroom interactions. One adult portrayed the child whose role was to engage in either

appropriate or inappropriate behavior while the second adult portrayed the teacher whose role was to model the correct proactive or reactive response to the "child's" behavior.

Response Measurement and Interobserver Agreement

Digital Teacher 4.21 (Francis Software Inc., 1998) recorded participants' responses during the computer-based training program. During scripted role-plays, observers scored responses as correct or incorrect based on their occurrence or nonoccurrence. For example, the delivery of an antecedent (proactive strategy) such as providing a choice was scored as correct if it occurred at the appropriate time (in the absence of problem behavior) or incorrect if it did not occur at the appropriate time (following problem behavior), was framed incorrectly (e.g., "What do you want to do?" versus labeling the available activities), or was omitted. The delivery of a consequence (reactive strategy) such as ignoring a problem behavior and continuing with the activity was scored as correct if it occurred within 5 s following the problem behavior or incorrect if it did not occur. Sessions lasted 5 min.

During at least 25% of the scripted sessions, two trained observers independently viewed the videotapes and recorded participant behavior in all conditions. Interobserver agreement was calculated on an interval-by-interval basis. Percentage agreement scores were calculated by dividing the number of agreements by the number of agreements plus disagreements, multiplied by 100%. Mean agreement across participants was 91% (range, 75% to 100%).

Experimental Design

The effect of the computer-based training program was evaluated using a multiple baseline design across participants.

User Satisfaction

Participants responded to five items that asked them to rate their satisfaction with the program and willingness to recommend the program using a Likert-scale where a score of 1 indicated the participant strongly agreed and a score of 7 indicated the participant strongly disagreed.

Results and Discussion

Figure 3 presents the participants' pre- and posttest performances on the computer-based training program across three categories of typical teacher-child preschool classroom interactions: child appropriate (A), child inappropriate (I), and teacher prompt (P). The top panel shows the results of the teaching test in which participants repeated the 24-item test (12 appropriate, 7 inappropriate, 5 participant delivered prompts consisting of offering 3 choices and delivering 2 requests) until they met criterion (100% correct). Pretest scores showed a low level of correct responses across all categories (M = 13%) with the exception of Kristin who scored 60% correct on P questions at pretest. Given that the program required participants to meet the 100% correct criterion before advancing to the generalization posttest, and since all participants met the criteria, only a summary of the results of participants' first attempt at posttest will be provided. Hash marks depict participants' first attempt, the absence of a hash mark represents 100% correct on the first attempt. Participants' first-attempt scores were on average 92% correct (range, 86% to 100%) on A

questions, 89% correct (range, 86% to 100%) on I questions, and 66% correct (range 40% to 100%) on P questions.

The results of the 12–item generalization test (six appropriate, four inappropriate, two prompts (one request and one choice) are presented in the bottom panel of Figure 1. Pretest scores showed a low level of correct responding across all categories for all participants (M = 28%). However, all participants scored at or above 75% correct across all three categories at posttest. In addition, all participants scored 100% correct on P questions at posttest. Hannah and Karla scored 75% correct on A questions and 100% correct for I questions at posttest. Alan and Kristin both scored 75% and 83% correct on the posttest for A and I questions, respectively.

Figure 4 presents the percentage of correct responses to appropriate and inappropriate child behavior and correct participant-delivered prompts (choices and requests) during scripted role plays for all participants. Scores for responses to appropriate child behavior were at or near 100% correct in all conditions and therefore will not be reported graphically. Baseline data show a low rate of correct responding to inappropriate child behavior across participants (M = 26%) and correct participant prompts (M = 19%). Post-training data show an immediate increase in correct responses for Hannah who met criterion, 100% correct, in the third session post computer-based training. Alan's data were variable immediately following training then stabilized near 75% correct for both response to inappropriate behavior and prompts. Although correct responses to inappropriate behavior increased to and maintained at 86% correct or above following the second computer training session,

prompts decreased to baseline levels. Data for Karla showed an immediate and somewhat steady increase in correct responding to inappropriate behavior and prompt delivery at post-training. Following the completion of the second computer training session, responses to inappropriate behavior increased to 88% or higher. No change in prompts was observed. Kristin's data show an immediate and steady increase in correct responses to inappropriate behavior. Although an overall increase in correct responding occurred (*Ms* = 33% and 58% at baseline and post training, respectively) prompt scores were more variable. Correct responses to inappropriate behavior and delivery of prompts increased following the second computer training session. The three remaining participants reached mastery criterion across 20 opportunities (8 appropriate, 8 inappropriate, 4 prompts comprised of offering 2 choices and delivering 2 requests) following the introduction of feedback. The number of sessions to reach criterion ranged from 3 (Hannah) to 15 (Arthur).

We were also interested in determining the effect of the addition of the videos (i.e., modeling) between and within participants' performance during the computer-based training. Therefore we conducted a t-test to further examine the effect of the videos. Participants in Group 1 were comprised of seven undergraduate students enrolled in an introduction to behavior analysis course who completed the computer training without the videos. Group 2 was comprised of all four participants from Experiment 2 and three new undergraduate students enrolled in an introduction to behavior analysis course who completed the computer training with the videos. Results of a t-test comparing Group 1 and Group 2 mean percent correct on the

computer-based training program performance are presented in Figure 5. No statistical difference was found between groups at pretest or posttest. Nevertheless, the improvements for the video group were greater than the improvements in the no video group (*Ms* = 73% and 62%, respectively). This difference was statistically significant at $p < .05$.

We were also interested in determining the effect of the videos between and within participants' performance during role-plays. However, due to time constraints, we were unable to run additional participants. Therefore, Figure 6 depicts a comparison between participants' performances in Experiment 1 (no video) and Experiment 2 (video) during role-plays. Baseline data show a low mean percent correct on the pretest for Experiments 1 and 2 (*Ms* = 21% and 22%, respectively). Post computer training data showed an increase in correct responding for Experiments 1 and 2, (*Ms* = 42% and 70%, respectively). No statistical difference was found between studies at baseline or post training.

However, a visual inspection of the data suggested that a difference a difference existed between the participants whose training did and did not include videos. Therefore, we examined the percent change from baseline to post training for participants' performances during role-plays. Table 2 shows the results of these calculations during role plays for prompts (i.e., participant delivered requests and choices) and correct response to inappropriate behavior for participants whose training did not include video training (Experiment 1) and participants who training included videos (Experiment 2). Percent change from baseline for prompts during

role-play assessments showed a 67% change for those participants in the no-video group and a 233% change from baseline for participants whose computer training included videos. In addition, although the no-video group's baseline was higher (*M* = 25%) than the video group (*M* = 18.75%), they scored below 50% correct at post training. Furthermore, if the no-video group had shown a 233% change, as did the video group, their posttest scores would have averaged 83% correct. Finally, although the no-video group's percent change for inappropriate behavior was greater than the video group's (*Ms* = 215% and 199%, respectively), the no-video group mean score for correct response to inappropriate behavior post computer training was 54% correct as compared to 77% correct for participants whose computer training included videos.

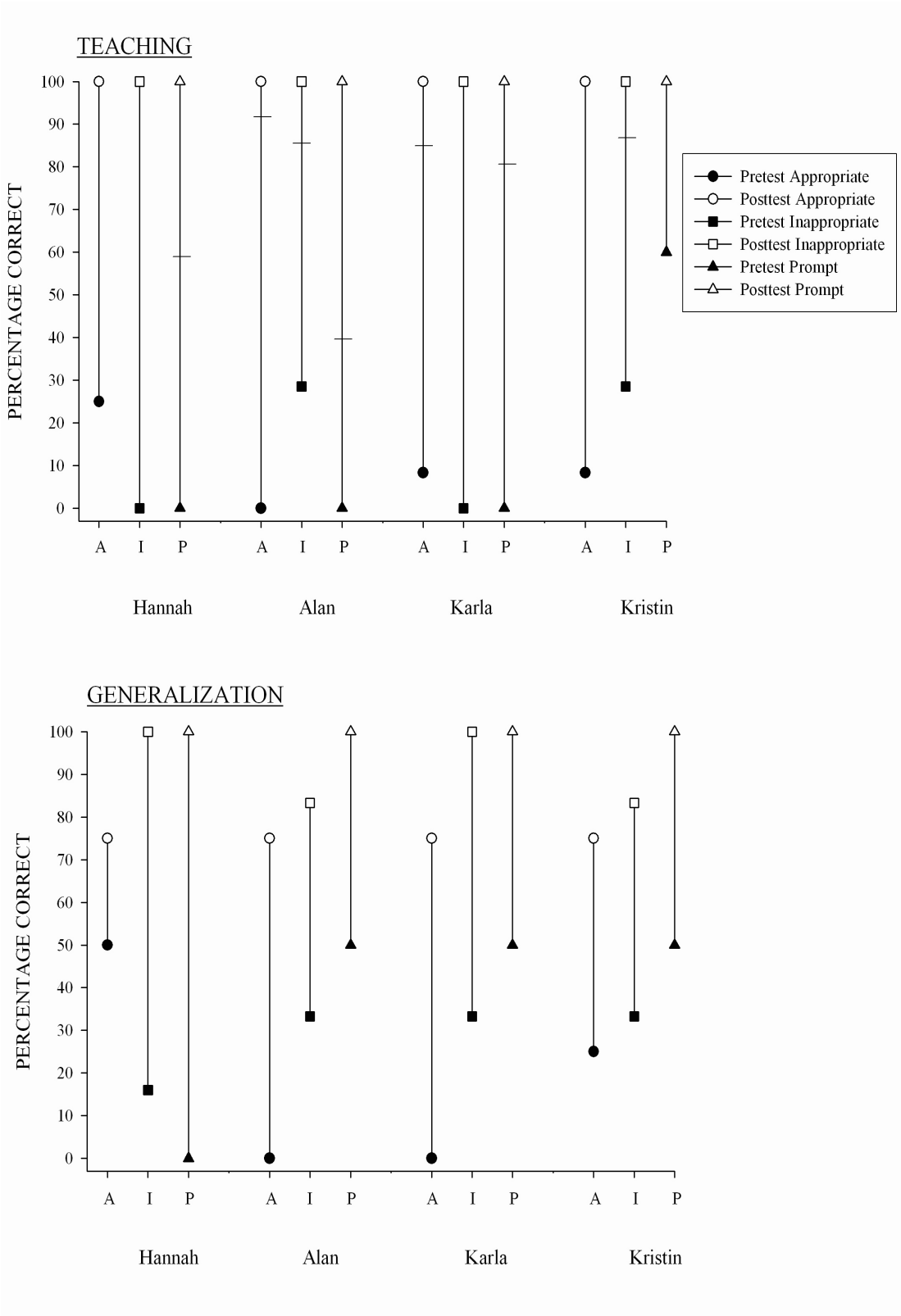
Table 3 shows participants' ratings of the computer-based training program. Two participants somewhat disagreed that that enjoyed learning via the computer-based training program. However, all three participants who completed the questionnaire agreed that they were more confident in their ability to increase desirable behavior and decrease problem behavior after completing the training. All respondents agreed that they would use the strategies in a preschool classroom. Response for questions 3, 4, and 5 ranged from somewhat agree to strongly agree concerning their use of the strategies in a preschool classroom and their recommendation of and use of the computer-based training program to train preschool teachers.

The results of Experiment 2 showed that following the completion of the

computer-based training program participants' knowledge increased at posttest, and correct application of classroom behavior management strategies increased during role-plays. For example, all participants reached criterion on the teaching posttest. In fact, first attempt scores were on average 82% correct across all three categories. In addition, generalization posttest scores were on average 89% correct across all three categories. The number of sessions to criterion for inappropriate and prompt responses varied across participants. For example, Hannah reached criterion within three post-training sessions while Alan reached criterion after 15 post-training sessions that required a second computer training and feedback. Karla and Kristin reached criterion at sessions 11 and 12, respectively, and only after feedback was implemented. Finally, as in Experiment 1, baseline data indicated that the participants had the skills in their repertoire to respond correctly to appropriate child behavior during role-plays prior to training.

The purpose of Experiment 2 was to investigate the effect of the addition of videotaped demonstrations of the application of proactive and reactive behavior-management strategies on participants' performance during the computer-based training and role-plays. Overall, participants whose training included videos attained higher mean scores for P questions (teacher delivered prompts and choices) on the teaching posttest than those without videos (66% and 40%, respectively). In addition, participants whose training included videos scored higher at post training on prompts (62% and 42%, respectively) and response to inappropriate behavior during role-plays (77% and 54%, respectively).

In an attempt to replicate and extend the results of Experiment 2, we designed Experiment 3 to investigate the effect of the computer-based training on the application of the proactive and reactive behavior-management strategies in the Edna A. Hill Child Development Center preschool classroom. The computer-based training was identical to that of Experiment 2; however, based on the results from Experiment's 1 and 2, we decided to eliminate the second computer training and implement feedback only, if needed. That is, following a second computer training the improvements in Experiment 2 participants' performances did not significantly improve relative to participants' performances in Experiment 1 (feedback) to warrant the inclusion of further computer training.


TEACHING
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A I P A I P A I P A I P
Hannah
Alan
Karla
Kristin
Pretest Appropriate
Posttest Appropriate
Pretest Inappropriate
Posttest Inappropriate
Pretest Prompt
Posttest Prompt
GENERALIZATION
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A I P A I P A I P A I P
Hannah
Alan
Karla
Kristin

Figure 3. Performances on the computer-based training program across three categories of typical teacher-child interactions: abbreviations are A for child appropriate, I for child inappropriate, and P for teacher prompt. Hash marks indicate first attempt scores during the teaching posttest (top panel only).

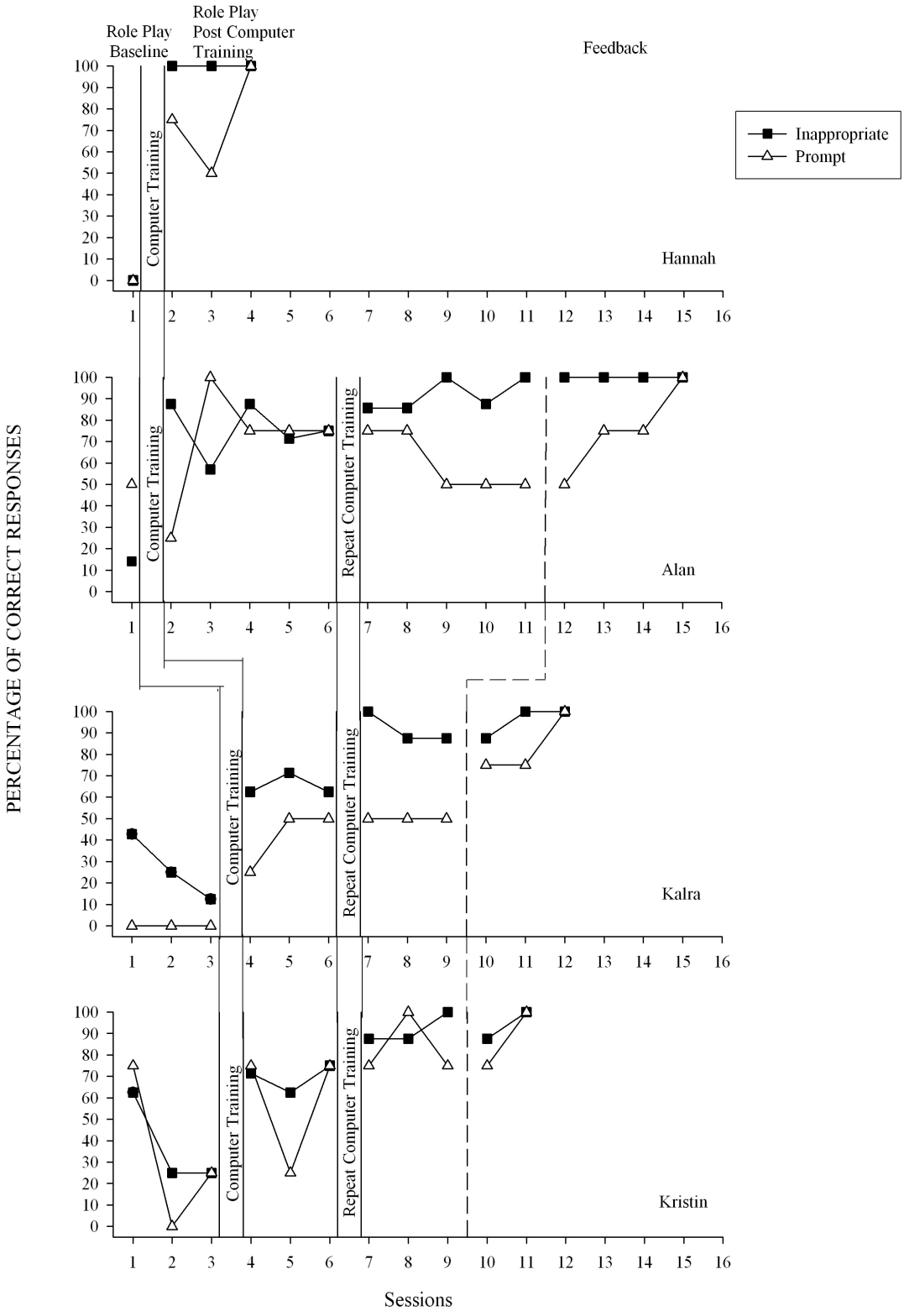

Role Play
Baseline
Role Play
Post Computer
Training
Feedback
Inappropriate
Prompt
Computer Training
Repeat Computer Training
Hannah
Alan
Kalra
Kristin
PERCENTAGE OF CORRECT RESPONSES
Sessions

Figure 4. Percentage of correct responses to inappropriate child behavior and correct participant delivered prompts (i.e., choices and requests) during scripted role-plays for Experiment 2 participants.

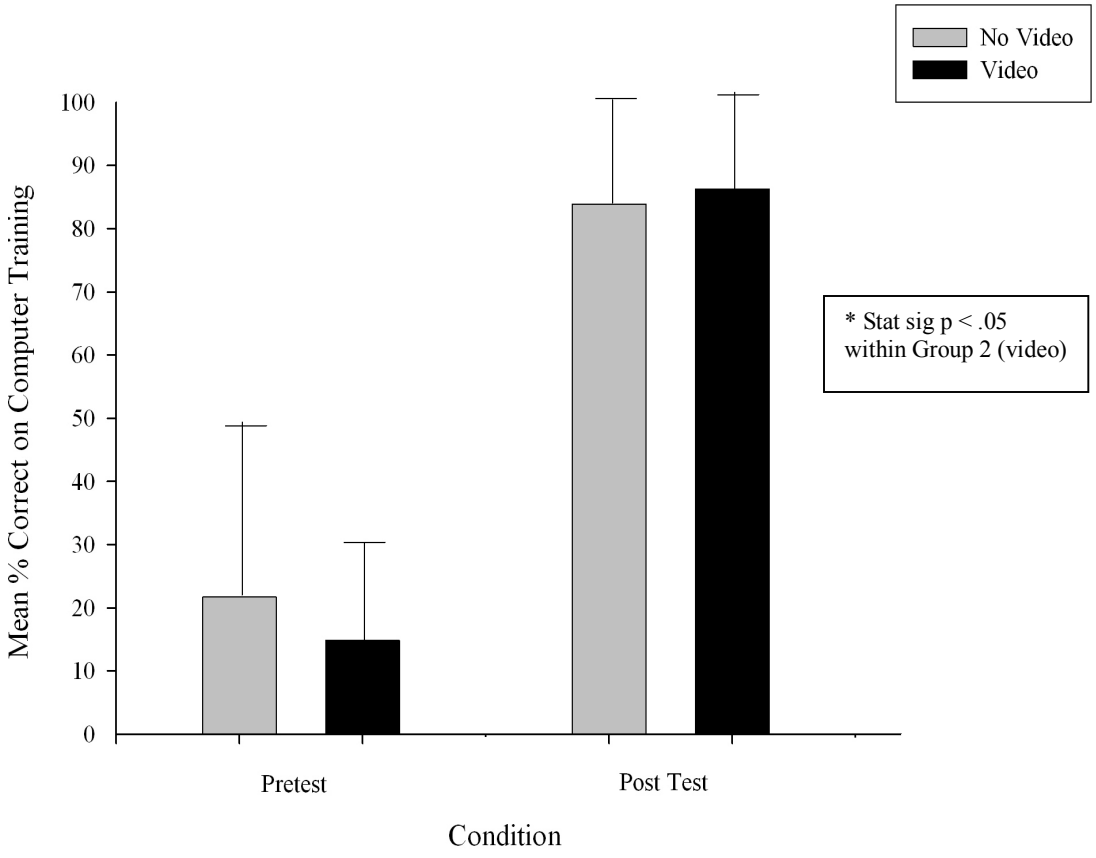


Figure 5. Results of a t-test comparing Group 1 (no video) and Group 2 (video) mean percent correct on the computer-based training program.

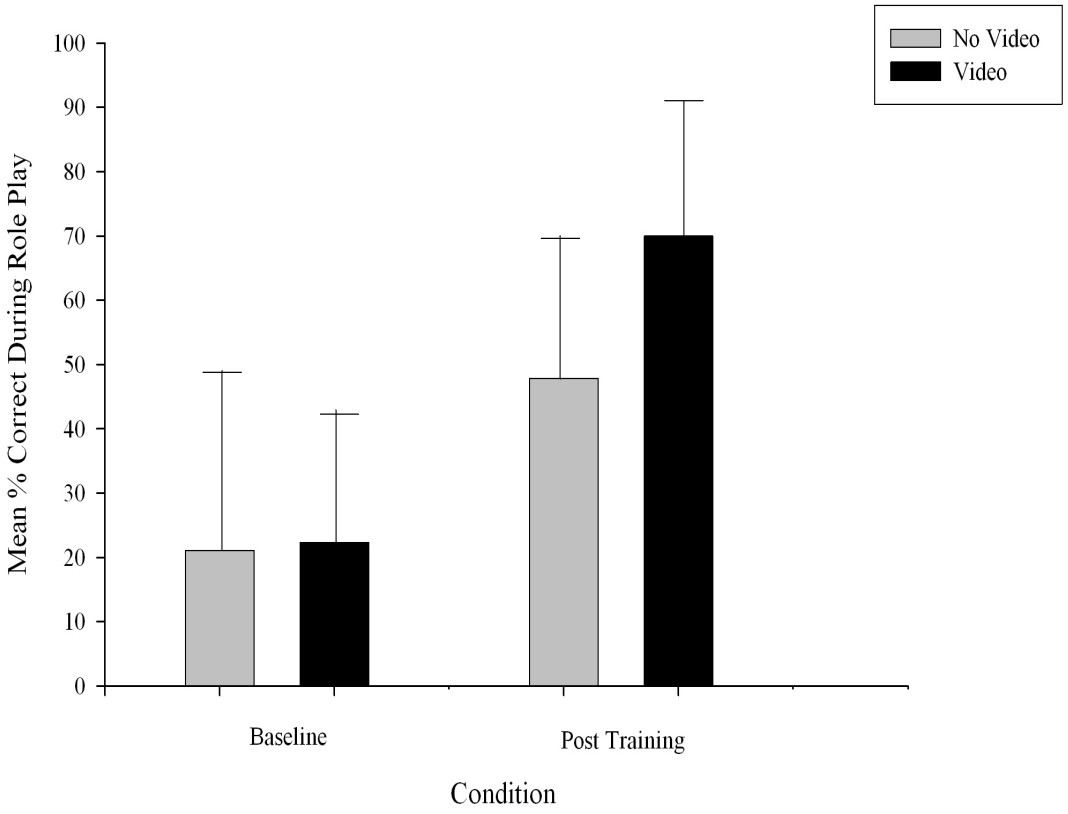


Figure 6. Comparison of participants' performances in Experiment 1 (no video) and Experiment 2 (video) during role-plays.

Table 2

Percent Change During Role Plays

Prompt			
No Videos		Videos	
Percent Change from Baseline		Percent Change from Baseline	
Mean BL	25.00	Mean BL	18.75
Mean TX	41.67	Mean TX	62.50
% Change	66.67%	% Change	233.33%

Inappropriate			
No Videos		Videos	
Percent Change from Baseline		Percent Change from Baseline	
Mean BL	17.15	Mean BL	25.88
Mean TX	54.01	Mean TX	77.41
% Change	214.92%	% Change	199.16%

No videos versus videos in the computer training

Formula for percent change: [(TX/BL)-1]*100 = ___ %

Percent change from baseline to post training during role plays for prompts (i.e., teacher delivered requests and choices) and correct response to inappropriate behavior for participants who did not receive video training (Experiment 1) and participants who training included videos (Experiment 2).

Table 3

Participant Ratings of the Computer-Based Training Program With Videos

Survey item	1	2	3	4	5	6	7
1. I enjoyed learning via the computer-based training program.			1		2		
2. After completing the computer-based training program, I am more confident that I can increase desirable behavior and decrease problem behavior in the preschool classroom.		3					
3. I would use the proactive and reactive strategies described in the computer program in a preschool classroom.	1	2					
4. I would recommend this computer-based training program to preschool teachers.	1	1	1				
5. I would use this computer-based training program to train preschool teachers.	1		2				

1 = Strongly Agree, 7 = Strongly Disagree

The above data represents a total of three returned questionnaires.

EXPERIMENT 3

Method

Participants, Setting, and Materials

One undergraduate female student enrolled in an introduction to behavior analysis course participated along with one typically developing boy and one typically developing girl who attended a university's preschool classroom. Children were chosen to participate based on availability and teacher report of the increased likelihood of the occurrence of problem behavior relative to other children in the classroom. Setting and materials were the same as in Experiment 2 except for the following changes. Observations of participant/child interactions were conducted in the university's preschool classroom, which consisted of four child size tables and chairs and common preschool toys. Sessions were conducted on the floor in an area away from classroom activities. The number of children and teachers present in the classroom during sessions varied but was at most 15 and 4, respectively, at any one time.

Response Measurement and Interobserver Agreement

Digital Teacher 4.21 (Francis Software Inc., 1998) recorded the participant's responses during the computer-based training program. During classroom observations, observers scored responses as correct or incorrect based on their occurrence or nonoccurrence. For example, the delivery of an antecedent (proactive strategy) such as providing a choice was scored as correct if it occurred at the appropriate time (in the absence of problem behavior) or incorrect if it did not occur

at the appropriate time (following problem behavior), was framed incorrectly (e.g., "What do you want to do?" versus labeling the available activities), or was omitted. The delivery of a consequence (reactive strategy) such as ignoring a problem behavior and continuing with the activity was scored as correct if it occurred within 5 s following the problem behavior and incorrect if it did not occur. Four dependent measures of participant behavior were collected: delivery of a request, offering a choice, praise, and follow through (i.e., the application of the correct reactive strategy) following problem behavior. Based on the previous findings that Experiment 1 and 2 participants responded at criterion levels at baseline for responses to appropriate behavior, data on appropriate behavior was not collected. The dependent measure for child behavior was problem behavior and was defined as aggression, motor disruption, and/ or vocal disruption (see Appendix D for further descriptions). Sessions lasted 10 min.

During at least 20% of sessions, in both conditions, two trained observers simultaneously but independently recorded participant and child behavior. Interobserver agreement was calculated on an interval-by-interval basis. Percentage agreement scores were calculated by dividing the number of agreements by the number of agreements plus disagreements, multiplied by 100%. Mean agreement across observers was 94% (range, 80% to 98%).

Experimental Design

The effect of the computer-based training program was evaluated using an AB design.

Results and Discussion

In the interest of further understanding the effect of the computer-based training on specific participant behavior, we reported data on teacher delivered requests and teacher offered choices separately rather than as one behavior (i.e., prompts) as was done in the two previous studies. Figure 7 displays Sharon's pre-posttest performance on the computer-based training program across four categories of typical teacher-child preschool classroom interactions: child appropriate, child inappropriate, teacher-delivered requests, and teacher-offered choices. The top panel shows the results of the teaching test in which Sharon repeated the 24-item test until she met criterion (100% correct). Pretest scores show a low level of correct responding across all four categories (M = 25%). Given that the computer program required 100% correct responding during the teaching posttest before allowing access to the generalization posttest, the results of Sharon's first attempt will be discussed. Hash marks depict her first attempt; the absence of a hash mark represents 100% correct on the first attempt. Sharon scored 100% correct the first time on appropriate, inappropriate, and request questions and 66% correct (two out of three) on her first attempt on choice questions.

Results of the 12–item generalization test are presented in the bottom panel of Figure 7. Pretest scores showed a low level of correct responding across all categories (M = 31%). However, Sharon scored 100% correct at posttest across all three categories.

The top panel of Figure 8 presents the percentage of correct responses to

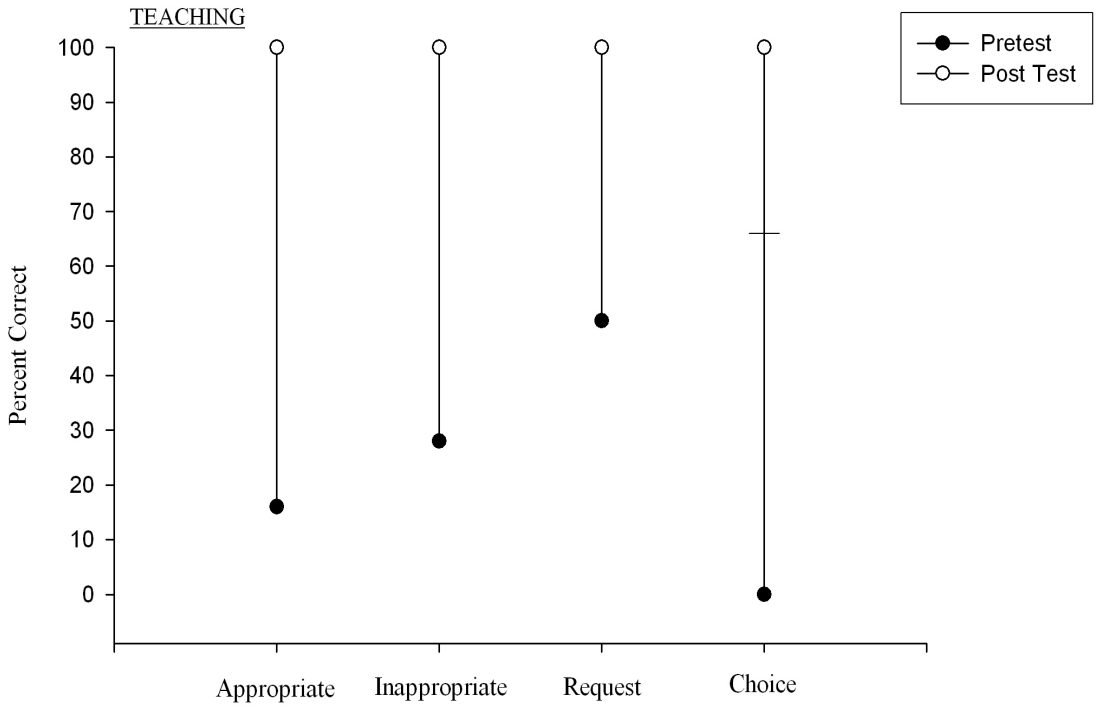
inappropriate child behavior and correct participant delivered choices and requests (prompts) during classroom observations with two preschool age children. Sharon never responded correctly to inappropriate behavior during baseline. The correct offering of choices and delivery of requests were also low at baseline (M = 20% and 5%, respectively). Post training data for requests and choices was variable though showed an increase relative to baseline. Response to inappropriate behavior revealed an increasing trend; Sharon met criterion (100% correct) in the last session.

The bottom panel of Figure 8 displays the total number of inappropriate behaviors for two preschool children during classroom observations. There was a low level of inappropriate behaviors during baseline (M = 1.8) that consisted mostly of grabbing toys and refusing to share. There was no change in the number of inappropriate behaviors at post computer training (M = 1.6).

Unfortunately, Sharon dropped out of the experiment post training; however, the data shows some increase in correct implementation of the behavior-management strategies. In fact, Sharon met criterion for responses to inappropriate behavior within five sessions post computer-based training. In addition, Sharon scored 75% correct for both offering choices and delivering requests within five sessions post training. Furthermore, the results of the computer-based training posttest for Experiment 3 are similar to that of both Experiments 1 and 2 and provide additional support for the effectiveness of this program in increasing participants' knowledge of classroom behavior management strategies.

Although these data are promising there are some limitations which future

research should address. First, only one person participated, which limits the generality of these findings. Second and perhaps the biggest limitation was the low level of observed problem behaviors. There were on average 1.8 occurrences of problem behavior during baseline, which was comprised of grabbing toys and refusing to share. What's more, problem behavior did not decrease post training; therefore, the effect of the computer-based training on problem behavior remains unknown. Future research is needed to determine the effect of the computer-based training on a variety of child inappropriate behaviors and should include the investigation of a variety of intensities and frequencies of problem behavior. Finally, since the participant dropped out before feedback was implemented the effect of this variable is unknown.


TEACHING
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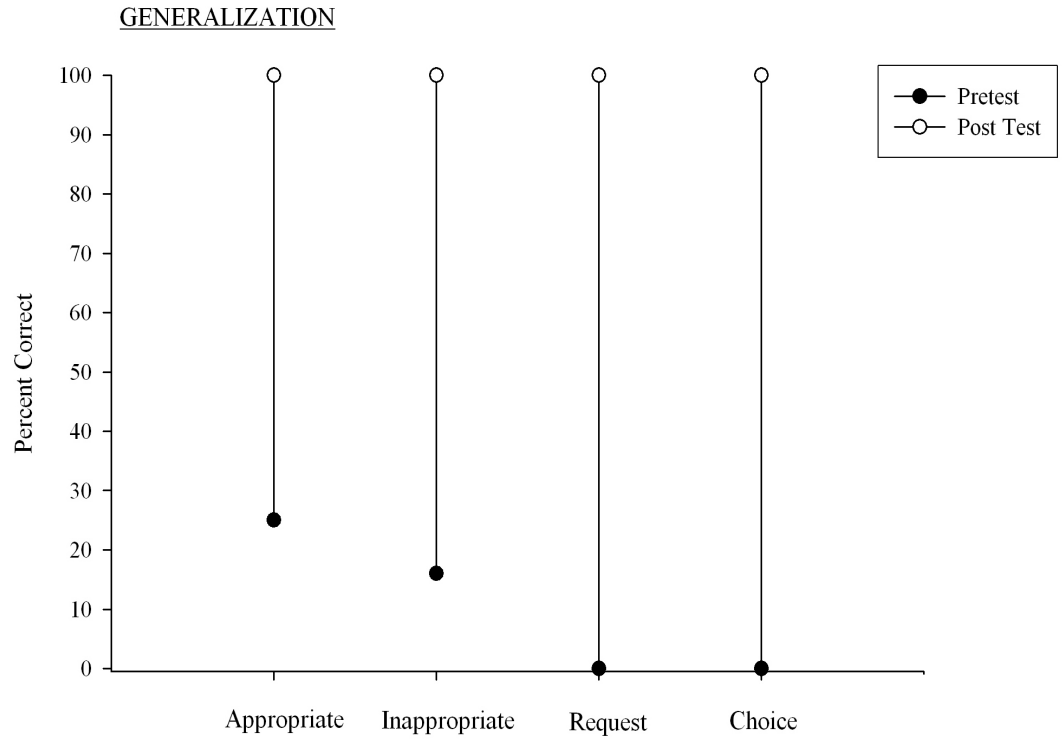
GENERALIZATION
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Post Test
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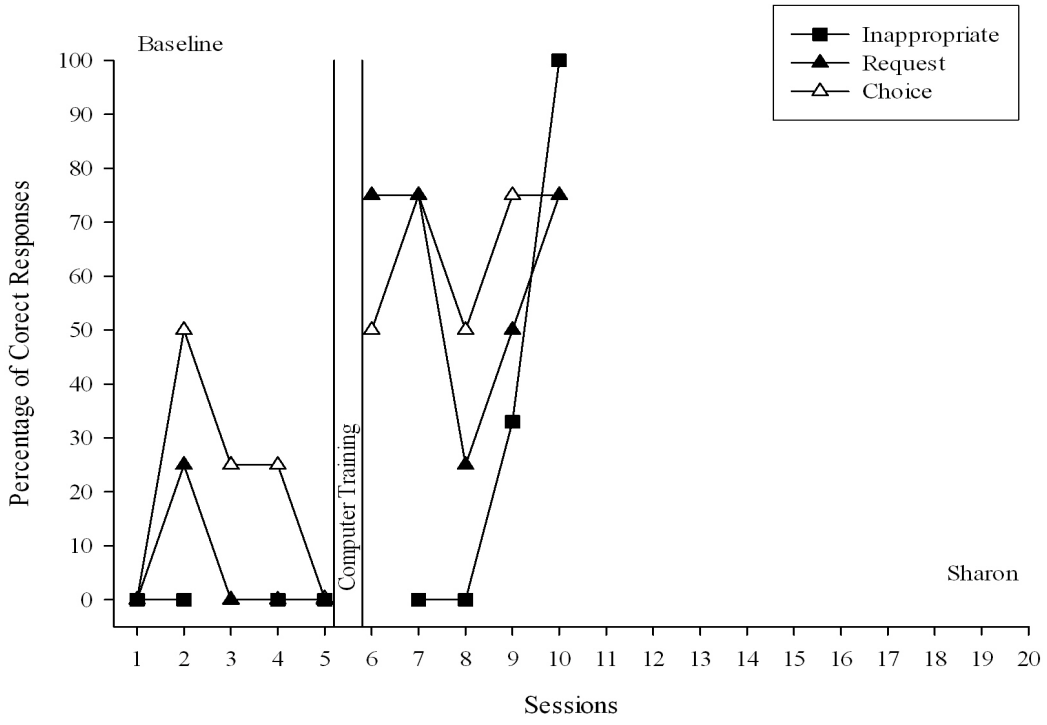
Request
Choice

Figure 7. Sharon's performance on the computer-based training program across three categories of typical teacher-child interactions: child appropriate, child inappropriate, teacher delivered request and teacher offered choice (prompts) for teaching (top panel) and generalization (bottom panel) test questions.


Baseline
Inappropriate
Request
Choice
Percentage of Corect Responses
Computer Training
Sharon
Sessions

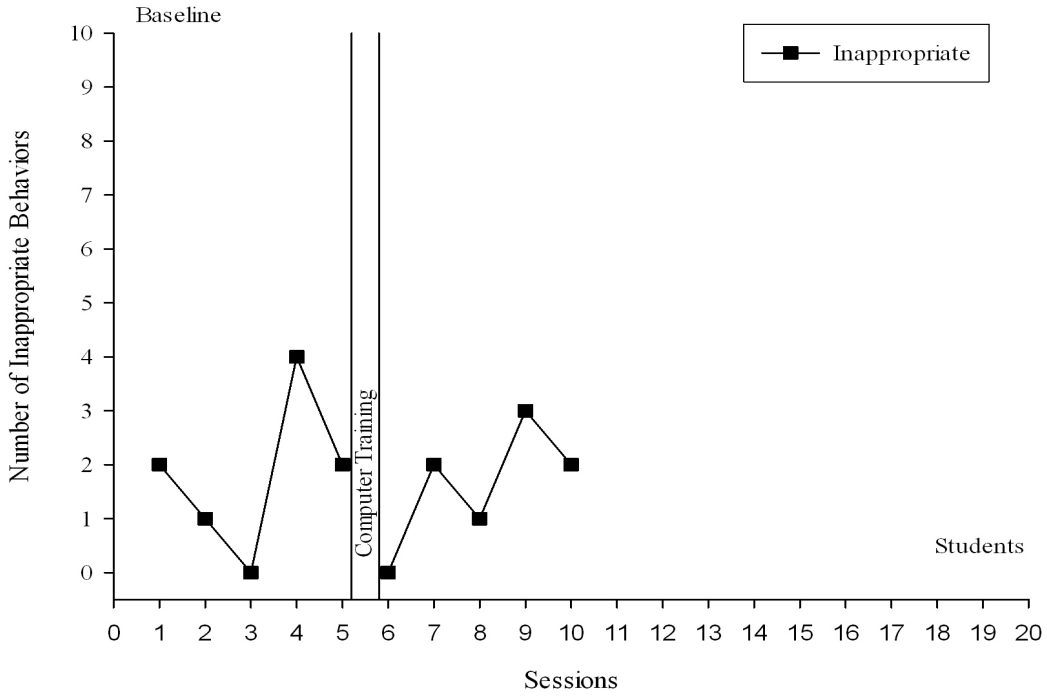

Baseline
Inappropriate
Number of Inappropriate Behaviors
Computer Training
Students
Sessions

Figure 8. Percentage of correct responses to inappropriate child behavior and correct participant-delivered requests and choices (prompts) during classroom observations with two preschool age children (top panel). Total number of inappropriate behaviors for two preschool children during classroom observations (bottom panel).

GENERAL DISCUSSION

In Experiments 1, 2, and, 3 all 9 participants increased their knowledge of classroom behavior management strategies. Thus, the use of a computer-based training program was effective in teaching behavior-management strategies. Furthermore, in both Experiments 1 and 2, all participants met criterion during role-plays. Analyses comparing the results of the computer training and role-plays for both studies suggest that the differences between the two experiments were a function of the addition of the videos. For example, a statistically significant difference within participants was found at posttest for participants whose computer-based training included videos. Moreover, a comparison of the percent change from baseline to post training during role-plays revealed a larger increase (i.e., 233.33% for prompts) in correct responding at post training for participants in Experiment 2. In that the only procedural difference in training between the two studies was the edition of videos, the results suggests that the larger percent change was a function of the addition of videos in Experiment 2.

Also, we added a second computer training in Experiment 2 to determine if feedback could be eliminated. However, the data showed that the addition of a second computer-based training did not produce criterion performance and that most participants met criterion when and only when feedback was added. These data are consistent with previous research, which suggests that feedback may be a necessary component for participants to meet criterion (Codding et al., 2005; Demchak, 1987; Ingvarsson & Hanley, 2006; Quilitch, 1975; Roscoe et al., 2006).

The use of scripted role-plays during Experiments 1 and 2 to assess the computer-based training rather than actual participant-child interactions limits the results of these studies. In fact, the investigation of the effects of a computer-based training program on participants' behavior during scripted role-plays rather than during in vivo assessment may at first seem questionable. Indeed, if the behavior-management strategies taught via the computer program do not generalize to the classroom the significance of this technology is questionable. However, when attempting to design a new technology, the use of simulated situations can still prove valuable. For example, if behavior change does not occur in a controlled environment, the likelihood of it occurring in the natural environment decreases. But researchers can still use the information gathered from studies conducted in the controlled environment to make the necessary changes to procedures before evaluating programs in the natural environment. Experiment 3 was designed to address this limitation and provides some preliminary evidence to support the effectiveness of the computer-based training to increase correct responses to inappropriate behavior and the correct framing of requests and choices in the classroom environment.

Though the results of Experiment 3 are limited due to participant attrition, data for Sharon suggest that the increase in correct responding at post training was a function of the computer-based training. However, the number of occurrences of child inappropriate behavior did not decrease, which suggests that either some change in the training is needed, feedback is necessary, or some combination of both. In

addition, a major limit of Experiment 3 was the lack of child problem behavior. This low rate and relatively mild problem behavior weakens the robustness of the results. That is, low rates of relatively mild problem behavior occurred, which in turn decreased the number of opportunities for the participant to implement all of the reactive strategies (e.g., sit and watch). Therefore, the effect of the computer-based training on participant implementation of reactive strategies and the concomitant effects on child problem behavior remain unknown.

Another limiting factor may be that all participants were enrolled in a behavior analytic introductory course during their participation in the study. Since both the class and the computer program covered basic principles of behavior analysis (e.g., reinforcement and punishment) the separate effect of the classroom material is unknown.

Finally, anecdotal report from participants revealed that different learning styles might affect users' performance thus limiting interpretation of the results. For example, Sharon reported that she preferred to read questions before reading text while Alan preferred to move forward and backward throughout the program. The current program design did allow Sharon to view the program according to her preferences, which may have contributed to her scores on her first-attempt on the teaching posttest (i.e., 100% correct for appropriate, inappropriate and request, and 66% correct on choice questions). However, Alan's navigation preferences were restricted by the current program, which may have also contributed to his slightly lower scores for his first attempt on the teaching posttest (91%, 85%, and 40% correct

for A, I, and P questions, respectively).

In an attempt to understand the relation between learning style, presentation of material, and subsequent performance, Liegle and Janicki (2006) examined the relationship between individual learning style and system-controlled versus learner-controlled presentation of material. System control directs the learner through the program via predefined steps. Learner control allows learners to navigate through the program based on their learning needs (e.g., skipping modules or accessing information in a different order than the original presentation). Fifteen participants were classified as "observers" (learners requiring guided instruction), and 43 were classified as "explorers" (learners who prefer to construct their own mode of learning).

Results were twofold. First, observers jumped (i.e., clicking on a link other than the next suggested link) significantly fewer times than explorers. Second, observers who did not jump scored significantly higher on posttest scores compared to observers who did jump. Similarly, explorers that did jump scored significantly higher on posttest scores than explorers who did not jump. This suggests that learning style in combination with the type of navigation used may impact the amount of learning during computer-based training. Likewise, Vincent and Ross' (2001) discussion of the use of learning styles to inform the development of more effective training programs suggests that different approaches to teaching are needed based on the individual learning styles of students.

The behavioral process of stimulus generalization may, in part, explain the

occurrence of correct responding during the generalization posttest and the increase in correct responses during post computer training role-plays. For example, since questions on the teaching and generalization posttests were similar in content (i.e., similar stimuli), and since reinforcement was provided for correct responses during the teaching posttest section only, correct responding in the presence of the generalization posttest questions may be a result of stimulus generalization (e.g., Stokes & Baer, 1977). Stimulus generalization may have also occurred during role-plays. Specifically, the scenarios describing teacher and child behavior in the teaching posttest (reinforcement for correct responding was provided) were similar in content (i.e., similar stimuli) to the scripted behaviors used in the role-plays (no programmed reinforcement for correct responding). Therefore, correct responding in the presence of similar "child" behavior during role-plays may have been due to stimulus generalization.

Our research adds to the current literature in three ways. First, the results not only provide support for the use of computer-based training to teach classroom behavior management strategies to teachers but also extend this literature base in that the use of computers to teach classroom behavior management skills has not, to our knowledge, been investigated. Second, unlike most research that has examined programs designed to intervene after behavior problems have developed, our program was designed for use prior to behavior becoming problematic. Third, most research on classroom behavior management has been conducted at the elementary and high school level whereas our research focused on developing a training program for

preschool teachers.

Although feedback was not the focus of this investigation, eight of the nine participants in Experiments 1 and 2 required performance feedback to reach criterion during role-plays. As mentioned above these data are consistent with previous research (Codding et al., 2005; Demchak, 1987; Ingvarsson & Hanley, 2006; Quilitch, 1975; Roscoe et al., 2006). For example, Hudson's (1982) investigation of the incorporation of verbal instructions, modeling, role-plays, and feedback during parent training was more effective then verbal instructions or verbal instructions plus behavioral principles. Likewise, Foster and Robert's (2007) examination of the effect of videotapes revealed additional training in the form of discussions, modeling, and in vivo feedback was needed for all 10 mothers to reach criteria. Conversely, Mueller and colleagues (2003) found that a combination of written protocol and vocal instructions delivered twice was sufficient to train caregivers to implement pediatric feeding protocols. Similarly, in the current investigation, Hannah (Experiment 2) did not require feedback to reach criterion. Future research should be conducted to determine the conditions under which the inclusion of feedback may be necessary.

An important finding of the current investigation was that Sharon (Experiment 3) met criterion for responses to inappropriate behavior in the classroom without the implementation of feedback before dropping out of the study. This outcome suggests that the use of a computer-based training program to teach behavior-management strategies may be an effective training method. Future research should continue to examine the effects of the computer-training program on the application of behavior-

management strategies in the classroom. Future research is also needed to determine the conditions under which the use of computer-based training to teach classroom behavior management strategies is most effective.

The current investigation incorporated videos demonstrating the correct application of behavior-management strategies using adult models. However, it is possible that the use of an adult and child to depict the application of classroom behavior management strategies in a classroom setting would have been more effective. Future research should investigate the effect of videos that depict adult-child interactions in the classroom setting on participants' application of these strategies in the classroom.

Research to determine the effect of the computer-based training program on participants application of the classroom behavior management strategies that includes children with a history of higher rates of problem behavior and a wider range of the severity of problem behavior (e.g., talking out in class versus throwing a chair at a classmate) is also needed. Finally, future research should be conducted to determine the relation between learning style and the mode of presentation used during computer-based training.

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Appendix A

Generalization pretest-posttest

1) Jennifer has a history of making loud, disruptive noises during group activities. To reduce this disruptive behavior, the most effective strategy that the teacher could use is:

A) Politely review the rules immediately following the disruptive behavior because this will serve as immediate negative reinforcement and will likely curb disruptive behavior

B) Use a proactive strategy such as Brief Description. For instance, immediately following disruptive behavior, briefly describe to the child the desirable behavior in which he or she should engage.

C) Use a proactive strategy such as Replacement of Positive Reinforcer. For example, provide the children Jennifer with consistent positive reinforcement for good behavior(e.g., smiling at the child and patting her gently on the shoulder while saying, "Jennifer, you are behaving like a such good, little girl today!"). When Jennifer misbehaves, replace the positive reinforcement with negative reinforcement (e.g., giving the child a one minute time out) will reduce the likelihood that Jennifer will continue to misbehave.

D) Review the rules before each activity in order to teach Jennifer to sit quietly with her hands on her lap.

E) combination of B & C.

2) David and Sam are sitting at the table with three other children. While waiting for

the teacher to start an art project, David and Sam start spitting into the air. The teacher removes David and Sam from the art activity for approximately one minute. Following their return to the table, she gives them a choice to continue with the activity or to choose a different activity. The teacher was:

A) incorrect to remove them from the activity and correct to offer a choice following a removal from the activity because although removing the children from the activity is a common strategy, it is a proactive strategy and should not be used in conjunction with a choice.

B) incorrect to remove them from the activity and also incorrect to offer a choice following a removal from the activity because although removing the children from the activity is a common strategy, it is often overused. Furthermore, offering choices should precede removals but not be acted upon until after re-entry so that the children have positive reinforcement to look forward to.

C) correct to remove them from the activity and correct to offer a choice following a removal from the activity because one minute "removals" and "offering choices" are two of the most effective reactive strategies for correcting disruptive behavior.

D) correct to remove them from the activity and correct to offer a choice following a removal from the activity.

E) correct to remove them from the activity but incorrect to offer a choice following a removal from the activity because offering a choice following a removal from the activity may, in fact, encourage disruptive behavior.

3) During snack time, Arnold notices that he doesn't have a napkin. The napkins are on the counter just out of his reach, so he asks the teacher for help reaching the napkins.

The teacher gets the napkin for him and says, "Here you go, Big Guy! What are you having for a snack?" The teacher's response will:

A) increase the likelihood that Arnold will continue to ask for help when needed because attention is a type of proactive strategy that increases desirable behavior.

B) increase the likelihood that Arnold will continue to ask for help when needed because interactive questions are Step I in Proactive Behavior Shaping that reinforce desirable behavior.

C) increase the likelihood that "all" the children will ask for help when needed because positive attention given to one child in a group is one strategy in Group Behavior Shaping that will increase the likelihood that other children will also ask for help.

D) decrease Arnold's tendency to grab for items because positive reinforcement has negative tendencies on problem behavior.

E) increase Arnold's tendency to request help at school and at home because attention is a reactive strategy that helps shape desirable behavior within and across settings.

4) Over the past week, Jared has begun scratching the teacher whenever he is engages in an activity he doesn't like. The teacher typically explains to Jared that scratching is not appropriate and selects another activity for him. Today, while drawing in the art

area, Jared again scratches the teacher. To decrease this problem behavior the teacher should:

A) Explain why scratching is not acceptable and ask Jared what he would like to do because explanations are reactive strategies and when mixed with choices help shape behavior in a positive manner.

B) Explain why scratching is not acceptable and prompt Jared to describe his preferred activity because explanations are proactive strategies and when mixed with choices help shape behavior in a positive manner.

C) Tell Jared "No scratching" and remove him from the activity because removals or "timeouts" are effective proactive strategies that will decrease problem behaviors.

D) Ignore the scratching completely while attending to desirable behavior because ignoring is an extremely effective alternative to delaying reinforcers as long as you give attention to desirable behaviors.

E) Ask Jared why he is scratching because questioning is step two in Positive Behavior Shaping that assists in identifying problem behavior so that it may be changed.

5) Over the past week, Maria has been throwing items. Typically, when Maria engages in this type of problem behavior, the teacher removes Maria from the activity. Although Maria's throwing has decreased, it continues. For example, today, during art, Maria threw the crayons.

In addition to the brief removal from the activity, the teacher should use three step

prompting, starting with a (A)____ prompt, followed by a (B)____ prompt, then a (C)____ prompt, to teach Maria to play with the materials instead of throwing them.

A) vocal

B) model

C) physical

6) Kendra often uses inappropriate language during breakfast time. After using words such as, "poopy head," she laughs and looks at her teachers and peers. To decrease this behavior, the teacher should (A)____ the problem behavior and at different times throughout the day proactively teach the appropriate language by (B)____ such words as "yikes," "rats," etc.

A) ignore

B) modeling

7) The teacher is presenting an activity at centers. She explains the rules of the activity and hands out materials.

The teacher can increase the likelihood that the children will enjoy the activity by providing (A)____ of (B)____ (C)____ materials.

A) choices

B) high

C) quality

8) The teacher instructs Joey to clean up the dress up area. While cleaning the area, Joey throws a belt across the room. The teacher immediately removes Joey from the dress up area for a brief period of time. As soon as the removal is over, the teacher

says, "How about you get the belt and finish cleaning up?" Because an instruction had been given the teacher should have:

A) immediately physically prompted Joey to clean up the dress up area because physical prompts are proactive strategies that help shape desirable behavior.

B) said to Joey after the removal, "We don't throw our dress up clothes" and physically prompted the correct response because explanations followed by physical prompts are reactive strategies that govern the Three Step Behavior Shaping process.

C) said to Joey after the removal, "Joey, clean up like this" and modeled the correct response because modeling, following a vocal request, is the next step in the prompting sequence after an instruction has been given.

D) done nothing differently because questions are preliminary reactive strategies that decrease problem behavior.

E) explained the rules of the dress up area and modeled the correct response because explanations followed by modeling are reactive strategies that govern the Three Step Behavior Shaping process.

9) Lee is working on a puzzle, and Jack offers to help. Lee kicks Jack in the stomach and tells him to go away. The teacher should:

A) Remove Lee from the activity for one minute because removing a child from an activity for one minute is a very effective way to delay access to reinforcers.

B) Remove Lee from the activity for three minutes but in this specific case, however, the teacher should also use a negative reinforcement strategy and

have the child apologize or sit quietly until the original activity is completed.

C) Remove Lee from the activity for a brief period of time because as a proactive strategy, removing a child from an activity for a brief period of time is an effective first step to decrease problem behavior.

D) Remove Lee from the activity for five minutes because removing a child from an activity for five minutes is a very effective reactive strategy.

E) Remove Lee from the activity for ten minutes because removing a child from an activity for ten minutes is a very effective reactive strategy.

10) Tara is usually shy and plays by herself. During group activities, she works by herself. One afternoon, the teacher sees Tara helping her friend put on a sweater in the dress up area.

The teacher should say "Wow, Tara, you are doing such a great job helping Jessica put on her sweater!" because (A)____ praise delivered to a child is an effective (B)____ strategy for increasing desirable behavior.

A) descriptive

B) proactive

11) During snack time, Jackie says, "This is the BEST juice I've ever had!" To increase this type of desirable behavior for Jackie and the class, the teacher could smile and say, "I like it too! Who wants more?"

In this example, the teacher's comment is an example of free reinforcement in which children receive (A)____ attention (B)____desirable behavior occurs.

A) immediate

B) after

12) Janice is playing in the dress-up area and can't reach the skirt that is on top of the counter. Janice asks the teacher for help. The teacher does not hesitate an instant and promptly hands her the skirt, and says, "Here you go. Won't you look pretty!"

The teacher's (A)____ attention will (B)____ the likelihood that Janice will continue asking for help when needed.

A) immediate

B) increase

Appendix B

Teaching pretest-posttest

1) While waiting in line, Liz pinches Tommy. The teacher should:

A) Gently guide Liz to the end of the line because ignoring problem behavior combined with delaying access to reinforcers is an effective reactive strategy to decrease problem behavior.

B) Remove Liz from the line for a brief period of time because delaying access to reinforcers is an effective proactive strategy to decrease problem behavior.

C) Tell Liz, "you shouldn't pinch your friends." because a brief rule reminder is an effective proactive strategy to decrease problem behavior.

D) Tell Liz, "No pinching." because a brief rule reminder is an effective reactive strategy to decrease problem behavior.

E) B & C because as a proactive strategy, rule reminders are most effective when combined with delaying access to reinforcers.

2) Karen wants to draw at the art area during free choice time.

She asks the teacher for a marker and some paper.

The teacher says, "Thanks for asking so nicely!" and promptly gives Karen a marker and some paper. The teacher's response is appropriate because it combines both (A)____ attention and (B)____ praise.

A) immediate

B) descriptive

3) Two children are sharing toys with their friends, playing independently, requesting

items appropriately, and making positive comments towards the teacher, and in general behaving the way teachers hope for. The teacher's response should be:

A) Smile and say "You children are playing very nicely together!" because praise and a smile are the first two steps in Group Behavior Management to reinforce desired behavior.

B) Smile and say "You children are playing very nicely together!" because descriptive praise and a smile are effective reactive strategies to reinforce desired behavior.

C) Smile and say "You children are playing very nicely together!" because praise and a smile are an effective first steps in Proactive Behavior Shaping to reinforce desired behavior.

D) Smile and say "You children are playing very nicely together!" because descriptive praise and a smile are effective proactive strategies to increase desired behavior.

E) Smile and say "You children are playing very nicely together!" because behavior specific praise and a smile are part of the third step in Group Behavior Management to reinforce desired behavior.

4) During transitions, Jordan frequently cries or says, "I don't want to!" In order to help Jordan transition appropriately between activities, the teacher hugs Jordan and tells him it's okay and that he will have fun at the next activity. Unfortunately, this approach may reinforce the problem behavior. A more effective approach would be to:

A) tell Jordan something brief like, "It's time to change activities" and then physically prompt him to transition because firm declarative instructions combined with physical prompts are effective steps in Proactive Behavior Shaping.

B) remove Jordan for five minutes because removals are effective proactive strategies to decrease problem behavior.

C) remind Jordan that the teacher's make the rules and model the appropriate transition behavior because brief rule reminders mixed with modeling are effective proactive strategies to increase desirable behavior.

D) offer a choice of where to sit, what materials to use, or between transitioning now or in two minutes because offering choices throughout the day is an effective proactive strategy which will increase the likelihood of desirable behavior.

E) ignore the crying and physically prompt Jordan to transition because ignoring problem behavior while physically prompting desirable behavior are effective second steps in Proactive Behavior Shaping.

5) Dana is playing with the Legos but is having trouble putting them together. Jackie shows Dana how to put them together, and they build a house. The teacher smiles at Jackie and says, "You sure are a terrific helper!" This response combines (A)____attention and (B)____praise, which will increase Jackie's helping behavior.

A) immediate

B) descriptive

6) It is time for free choice, and the teacher instructs Jimmy to choose an activity.

Jimmy screams across the room to Colin, "Hey Colin, come play blocks!" The teacher removes Jimmy for one minute and then says, "How about you go choose an activity?" and models the appropriate way choose an activity. Because an instruction had been given the teacher should have said:

A) "No yelling. How about you go choose an activity?" because brief rule reminders followed with choice are effective first steps in Positive Behavior Shaping.

B) "No yelling" and then physically guided Jimmy to choose an activity because rule reminders with physical prompts are effective reactive strategies to shape desirable behavior.

C) The teacher's response was correct because choice in the form of a question is a very effective proactive strategy to reinforce desirable behavior.

D) "Choose an activity like this" then modeled the appropriate way to choose an activity because instructions should be in the form of a directive.

E) "Choose an activity" and then physically guided Jimmy to choose an activity because choice in the form of a directive followed by physical prompts are effective reactive strategies to shape desirable behavior.

7) A group of students is sitting at the table waiting for the teacher to hand out material for their project. The teacher gives Alicia her materials, and Alicia says, "Thank you." The teacher says, "You're welcome. Thanks for using such polite manners." The teacher's response is effective because (A)____strategies such as offering (B)____praise will increase desirable behavior.

A) proactive

B) descriptive

8) The children are lined up to go out to the parking lot to see a fire truck. While waiting in line to go outside, Cindy turns the doorknob. The teacher should...?

A) Remove Cindy for five minutes because delaying access to reinforcers is an effective reactive strategy to decrease problem behavior.

B) Remind Cindy, "Only teachers touch doors" because brief rule reminders are an effective first step in Positive Behavior Shaping, which will decrease problem behavior.

C) Remove Cindy for three minutes because delaying access to reinforcers is an effective reactive strategy to decrease problem behavior.

D) Tell the class, "Only teachers touch doors" because brief rule reminders are effective reactive strategies to decrease problem behavior.

E) Move her to the back of the line because delaying access to reinforcers is an effective reactive strategy to decrease problem behavior.

9) While playing with the trucks, Steven bumps his truck into Mark's. Mark says, "Hey, stop it, stupid head!" The teacher should immediately (A)____both children from the activity for (B)____ (C)____.

A) remove

B) one

C) minute

10) Tanya is trying to put on her hat to go outside and is having a lot of trouble

getting it to stay on her head. She asks the teacher for help. The teacher should offer (A)____praise for Tanya's request and (B)____ the appropriate way to put on a hat.

A) descriptive

B) model

11) Tony is playing with the Legos and having trouble snapping two pieces together. Typically, when he does not know how to do something he tries for a while, gets frustrated, and gives up. This time, however, he politely asks the teacher for help. The teacher says, "Keep trying." Unfortunately, the teacher's response may decrease the likelihood that Tony continues to request assistance when needed because (A)____the request is a reactive strategy used only to (B)____ (C)____ behavior.

A) ignoring

B) decrease

C) problem

12) It is time to go outside and Brian is trying to get his hat out of his cubby. Brian can't reach his hat and asks the teacher for help. The teacher says, "Thanks, Brian, for asking for help!" and hands the hat to him. The teacher's response is a good example of the use of (A)^descriptive^ praise to (B)^increase^ desirable behavior.

A) descriptive

B) increase

13) Jack wants to play with a car that is above the cubbies. Instead of taking it off the shelf, Jack asks for permission to play with the car and for the teacher to get it for him. The teacher says nothing to Jack and hands him the car. The teacher's response

was:

A) Incorrect. Say, "Here you go. What are you going to do with the car?" because engaging the child in conversation reinforces and facilitates play and verbal skills.

B) Incorrect. She should have smiled before handing him the car because smiling is a proactive strategy that is an effective first step in Positive Behavior Shaping.

C) Incorrect. Say, "Nice keeping your feet on the ground, I'll get it!" because descriptive praise is a proactive strategy that will increase desirable behavior.

D) Correct because ignoring is a an effective proactive strategy because in this specific instance, the car is the immediate reinforcer.

E) Correct because ignoring is an effective reactive strategy because in this specific instance, the car is the immediate reinforcer.

14) Mandy is washing her hands. When she pushes the soap dispenser nothing comes out. Mandy tells the teacher there is no more soap and she needs some to wash her hands. In order to (A)____ Mandy's appropriate requesting, the teacher should deliver (B)____ praise to Mandy for letting her know that the soap was empty. For example, say, "Thanks so much for letting me know that the soap was empty!"

A) increase

B) descriptive

15) When preparing for an activity, make sure to provide (A)____of (B)____(C)____materials that promote interaction for all children in the classroom.

A) choices

B) high

C) quality

16) When the teacher finishes reading a book to the class during circle time, Marvin raises his hand and says, "That was a great book!" The teacher thanks Marvin for such a nice comment and for raising his hand. The teacher's response was appropriate because (A)____attention in the form of (B)____ praise is an effective (C)____ strategy to increase desirable behavior.

A) immediate

B) descriptive

C) proactive

17) Jake has a history of hitting other children to obtain access to toys and activities. The teacher should (A)^remove^Jake from the activity for (B)^one^ (C)^minute^.

A) remove

B) one

C) minute

18) Zack typically plays by himself or is quiet when playing with other children. Today, while playing together in the manipulatives area, the teacher hears Zack comment on the ship that Jeff built when he says, "That's a cool ship!" The teacher says, "Zack, that was a very nice thing to say to your friend!" The purpose of the teacher's descriptive praise is to (A)____ Zack's (B)____ behavior with his peers.

A) increase

B) desirable

19) The teacher instructs Steven to walk to his cubby and put on his coat. Instead,

Steven walks to his cubby and proceeds to throw his coat across the room. Since an instruction has been given, what is the next appropriate step in teaching Steven to walk to his cubby and put on his coat?

A) Remove Steven for a brief period of time then say, "walk to your cubby and put on your coat like this" and physically prompt the correct response.

B) Say, "Walk to your cubby and put your coat on like this" and physically prompt the correct response.

C) Say, "We don't throw our coats," and model the correct response.

D) Say, "Walk to your cubby and put your coat on like this" and model the correct response.

E) Say, "We don't throw our coats," and physically prompt the correct response.

20) Providing children a (A)____ of an activity before problem behavior occurs is one proactive strategy that will decrease the likelihood that problem behavior will occur. (B)____should NEVER be provided (C)____problem behavior occurs.

A) choice

B) choices

C) after

21) During snack time, Samantha frequently leaves her seat. To decrease this problem behavior the teacher should guide Samantha back to the table without talking to her or making eye contact. The teacher should then wait for Samantha to sit nicely and eat her snack. Upon seeing her sitting nicely and eating her snack, the teacher should offer (A)____ praise. The teacher's response followed a problem behavior and is a

(B)____ strategy that will decrease problem behavior.

A) descriptive

B) reactive

22) During snack time, Thomas spills his juice and the teacher says, "Thomas, go get a paper towel." Instead of getting a paper towel, Thomas says, "You're stupid." The teacher then says, "That's not nice. Why don't you get me a paper towel so we can clean this up?" Because an instruction had been given the teacher should have said...?

A) "Will you, please, get a paper towel like this?" and model the correct response.

B) "Go get a paper towel like this" and physically prompt the correct response.

C) "Will you, please, get a paper towel like this?" and physically prompt the correct response.

D) "Go get a paper towel like this" and model the correct response.

E) "Will you, please, get a paper towel like this?" and physically prompt the correct response as long as the physical prompt is followed with praise for completing the task.

23) Typically, when Jake wants to do something independently, he politely asks for permission. Today, while the teacher is helping Jake put on his coat, he says, "Get away from me, I can do it myself butt head." The teacher removes Jake for a brief period of time. Following the removal, the teacher guides him back to his coat. Because an (A)____ was not given, the next step in teaching is to allow Jake to return to the activity and then offer (B)____praise for any desirable behavior.

A) instruction

B) descriptive

24) During an art project, Kevin sits at the table with four other children. He quietly follows the directions and pastes his artwork together. The teacher tells him he is doing a great job pasting and proceeds to talk to him about his artwork. The teacher's response was appropriate because (A)____ attention in the form of (B)____ praise is an effective (C)____ strategy to reinforce desirable behavior.

A) immediate

B) descriptive

C) proactive

Appendix C

Educare Teacher Manual

The following program was designed to teach basic behavior-management strategies to teachers working in a typical preschool classroom. You will be asked to read Section III of the Educare manual and answer questions. The program is not timed. Be sure to choose the best answer for each question.

Strategies for Minimizing Problem Behaviors and Promoting Desirable Behaviors

Behavior is a function of both genetic and physiological factors as well as each child's history of personal experiences. However, behavior is most readily influenced by its immediate consequences. Behavior that results in an improvement for the child is strengthened (i.e., reinforcement). Behavior that results in a worsening or no relevant change for the child is weakened (i.e., punishment or extinction). Because we can't change the child's genetics or personal history, we attempt to create new histories that weaken problem behavior and strengthen socially desirable alternatives.

1. Behavior is most influenced by:
    a. immediate consequences
    b. genetic factors
    c. physiological factors
    d. history of personal experiences

Three important ways exist to classify problem behavior, and an understanding of the relationship between the three is essential for effective interaction in the classroom.

Behavior can be classified according to its topography (i.e., form or what it looks like), its function (i.e., purpose), or its social desirability. Undesirable or problem behaviors are those that seriously interfere with the target child's or another child's ability to engage in normal everyday activities. The necessary elements for a behavior to be considered a problem include some or all the following: a complainer, a victim, sufficient frequency, sufficient intensity, and safety compromises. Social rejection, withdrawal, and more serious problem behavior are likely to develop when problem behaviors are not addressed. The desirability of the behavior as well as its likely function will always need to be taken into account when minimizing problem behaviors and promoting desirable behaviors in the preschool classroom. A list of behavioral topographies classified according to desirability is provided later in this document. These are the general behavior targets for all children in the classrooms. Some of our most important goals are to minimize the number of problem behaviors and promote desirable alternatives.

2. Undesirable behaviors are behaviors that:

    a. the teacher finds annoying
    b. behaviors that seriously interfere with the child's ability to engage in normal everyday activities
    c. behaviors that seriously interfere with another child's ability to engage in normal everyday activities
    d. behaviors that seriously interfere with any child's ability to engage in normal everyday activities

Proactive Strategies

Proactive strategies occur prior to problem behavior and, if used often enough, prevent problem behavior from occurring.

A. Provide Ample Free reinforcement

Attention, praise, high quality play and instructional materials, and choices should be provided as often as possible to all children during the course of the day. By providing multiple types of good things (potential social and material positive reinforcers), the likelihood of children engaging in problem behaviors in order to gain teacher (or peer) attention or other classroom reinforcers will be low. Some specific procedures are described below.

Class Schedule. The class schedule is arranged so that children transition often throughout the day in order to maintain interaction with each new activity.

1. Thoughtful Lesson Planning. Circle, Center, Free-Choice, and Outdoor activities should contain high-quality materials that promote interaction for all of the children in the classroom.
2. Attention distribution. All children should receive some form of attention (e.g., eye contact and a smile, a comment about the child's play or creation, or a hug) at least once every 3 to 5 min. Be sure that your high-quality attention follows the most desirable behaviors noted below.
3. Choices. Provide children with choices throughout the day regarding instructional materials, toys, outdoor equipment, free-choice activities, etc. Be sure that you do not provide choices following problem behavior.

3. Teacher attention should be:

a. delivered only when a child is behaving well

b delivered only when children request it

c delivered to all children throughout the day

d delivered with a smile and only when children request it

e. delivered with a smile

B. Minimize potentially aversive aspects of the classroom and transitions

1. Warnings. Use warnings to signal that a current activity will be terminated and/or an alternative activity will be initiated. Do not use warnings as threats (e.g., If you do not stop…, then I will have to …)
2. Non-directive prompting. Instructions that typically occasion noncompliance can be delivered using nondirective prompts (e.g., "Let's fly like airplanes to the bathroom"), can be embedded within fun routines, or can be delivered within the context of instructions that guarantee compliance (i.e., behavioral momentum, e.g., "Touch your nose, give me five, place the book on the shelf").
3. Choices. Providing choices of materials, activities, or ways of doing things whenever possible may make problem behavior to escape or avoid situations less likely. However, do not provide choices following any type of undesirable behavior.
4. Errorless Teaching. Use errorless teaching strategies to ensure success (and minimize errors) with each new challenge (for more detailed information, see

Instructional Zone strategies in the manual).

4. Which of the following is NOT recommended practice to minimize aversive aspects of the classroom and transitions?

a. use errorless teaching strategies

b. use warnings as threats: If you do not stop…then I will have to …

c. provide choices

d. use non-directive prompting

e. all of these are recommended practices to minimize the aversive aspects of the classroom and transitions

C. Review rules prior to opportunities for rule-governed behavior

It is important to remind children of the rules prior to the child engaging in behavior that is inconsistent with the rule. Because it is difficult to determine exactly when a child may break a rule, teachers should remind children of the rules early each day or, better yet, immediately preceding specific opportunities to follow or break a rule. A few example follow.

1. Intermittently remind children that only "teachers open doors" prior to lining up at the door.
2. Intermittently remind children of mealtime routine prior to passing the 1st plate of food.
3. Intermittently remind children about acceptable behavior on outdoor equipment prior to their accessing the equipment.
4. Intermittently remind children about appropriate walking in the hallway

prior to transitioning to the Jayhawk room.

5. Review common classroom rules during Circle time (e.g., embed in a story or finger play).

5. When is it important to remind children of the rules:

    a. immediately preceding specific opportunities to follow or break a rule

    b. immediately following the rule breaking behavior

    c. once each day at a specified time

    d. immediately preceding or following specific opportunities to follow or break a rule

D. Reinforce desirable behavior

Teachers should at all times be looking for desirable behaviors (see list on next page) in order to reinforce them with their attention, or possibly more immediate access to preferred items and activities. Social reinforcers vary across children, so knowing what works best for each individual child, which may emerge after some time, is critical. However, there are a few things to consider with all children. “Good job” is the most common form of teacher attention and may become ineffective through repeated usage over time. Therefore, it is important to deliver descriptive praise or attention, which involves a description of something the child is doing or has done. Attention can also be more subtle, but often equally effective in strengthening the behavior that preceded its delivery (e.g., eye contact, a smile, initiating a conversation with a child). Reminder: Social reinforcement should be delivered immediate, often,

and exclusively following desirable behavior.

6. The most effective way to increase a behavior is:

    a. deliver descriptive praise or attention
    b. use individualized reinforcers
    c. deliver the reinforcer immediately, often, and exclusively following the desirable behavior
    d. all of these are effective

E. Prompt effectively (vocal, model, physical, or tell, show, help)

Start with a vocal prompt (i.e., tell the child the correct response) to complete the task. Be clear and concise, and allow sufficient time for the child to respond (3 to 5 s). If an incorrect response occurs or if no response occurs, proceed to the model prompt (i.e., show the child the correct response), and again prompt the child to complete the task. If an incorrect response occurs or if no response occurs, proceed to the physical prompt (i.e., help the child complete the correct response) by using the least amount of physical guidance necessary to complete the task while delivering the instruction for the third and last time. Praise correct (compliant) responses following the vocal or model prompt; withhold praise following a physically guided response during 3-step prompting. See "Strategies for the Instructional Zone" below for more detailed information regarding effective prompting.

7. Prompting should always occur in the following order:

    a. vocal, model
    b. model, vocal, physical

c. model only

d. vocal, model, physical

Reactive Strategies

Consistent use of the proactive strategies described above will eliminate most problem behavior from occurring. Unfortunately, problem behavior may still occur. The manner in which you respond to that problem behavior will make it more or less likely to occur in the future. Therefore, descriptions of safe and socially acceptable reactive strategies follow.

8. The manner in which you respond to a problem behavior will:

a. make it more or less likely to occur in the future

b. not alter the behavior in any way

c. always increase the behavior

d. always decrease the behavior

A. Delaying access to classroom reinforcers

Delaying access to common classroom reinforcers may take many forms and can be used almost anytime (i.e., irregardless of the function of problem behavior).

STEP 1: Immediate Response

Any of the following immediate responses are acceptable, although the third option should be the standard. The first option may be most helpful for children that are new to the program. The second option may be useful when desirable alternatives to the problem behavior have never been observed. The third option should be used when

the first two have been used at least twice by the same person.

(a) A reprimand may be delivered, although it is not essential. The reprimand should be stated firmly and always briefly, and the tone should always be neutral (never threatening). In essence, they should be brief rule reminders. Be sure that you have the child's full attention (i.e., eye contact) prior to and while the reprimand is delivered. Examples include: "No hitting," No running away," "No biting," and "No yelling inside."

(b) Alternatively, a brief description of the desirable alternative to the problem behavior may be provided. This too is not essential. The alternative behavior description should always be brief, and the tone should always be neutral (never threatening). In essence, they also should be brief rule reminders. Be sure that you have the child's full attention (i.e., eye contact) prior to and while the description of the desirable alternative is delivered. Examples include: "Walk in the hallway," "Use a quiet voice inside" or "We build with blocks."

(c) Finally, the teacher may choose to say nothing and simply move to the next step. This may be most appropriate if the same rule has been repeatedly described to the same child and/or if the child can and has been able to describe the desirable alternative to the problem behavior in the past.

9. The following option is the best choice when immediately responding to a problem behavior:

a. deliver a reprimand in a threatening tone so the child understands

that their behavior is unacceptable

b. say nothing and move to the next step in the activity

c. ask the child why they are engaging in the problem behavior

d. provide the child with a list of rules and explain why it is not acceptable to break the rules.

STEP 2: Reinforcement Delay (any of the following):

(a) Simply remove any reinforcing materials from the child's reach.

(b) Place the child further back in the line during transitions (i.e., at the door or at the choice board).

(c) Remove the child from the activity (1 to 3 feet), but allow the child to remain close enough to observe the presumably reinforcing activity from which he/she was removed.

(d) Remove the child from the activity area such that they cannot view the activity for at least 1-min. A teacher needs to stay near the child at all times. This strategy should be reserved for situations in which the child is disrupting the activity (e.g., yelling during Circle time) and/or the child's peers are reinforcing the problem behavior.

Note: Never deliver a reprimand or rule reminder following problem behavior (Step 1) without then delaying access to the classroom reinforcers (Step 2).

10. An effective way to delay reinforcement is:

a. remove any reinforcing materials form the child's reach

b. remove the child from the activity so they cannot view the activity

for at least one minute

c. remove the child from the activity but allow the child to remain close enough to view the activity

d. any of these answers are effective ways to delay reinforcement

Step 3: Re-entry (either of the following):

(a) Allow the child to re-enter the activity (replace materials in front of child, gently guide child back to activity) without making eye contact or saying a word to the child. Once the child is re-engaged in the activity, provide descriptive praise for any desirable behavior.

-or-

(b) After at least 1 min has passed, prompt the child to:

(i) sit with legs crossed and hands in lap quietly,

(ii) restore a disrupted environment (e.g., pick up the food that was thrown),

(iii) complete a simple task (e.g., place the bead on the string), or

(iv) state the desirable behaviors that he/she should engage in during the activity from which they were removed.

Upon compliance with the instruction, allow the child to re-enter the activity (replace materials in front of child, gently guide child back to activity). Once the child is re-engaged in the activity, provide descriptive praise for any desirable behavior. When prompts to restore the environment or complete a simple task are used, teachers should use either 3-step prompting or provide a

single verbal prompt and wait for compliance (be prepared to wait).

11. When helping a child re-enter an activity:
    a. the teacher helps the child to return to the activity as soon as the child is sitting quietly
    b. the teacher waits five minute before allowing the child back to the activity
    c. as soon as the child is sitting quietly the teacher explains why she/he was removed and then allows she/he to re-enter the activity
    d. allow the child to re-enter the activity without making eye-contact or saying a word to the child

Important note regarding problem behavior in the context of a teacher instruction: If problem behavior occurs while an instruction (i.e., any prompt issued by a teacher) is being delivered, it is best to continue with the instruction. Do not attend to the problem behavior, do not provide a reprimand or description of a desirable alternative, and do not terminate your instruction, simply follow-through with your original instruction (i.e., move to the next prompt in the sequence). However, if follow-through may lead to an unsafe or highly disruptive situation at that moment, it may be best to tell the child that you will continue when they are ready. At this point be sure they are removed from any potentially reinforcing materials. Re-initiate the prompting sequence when the situation is more manageable. It is critical that the child completes the initial instruction so that severe behavior does not result in the child escaping teacher instructions.

12. If problem behavior occurs following an instruction:

    a. the child should take a break

    b. the teacher should proceed with the instruction

    c. the teacher should change the activity to a more suitable one

    d. the teacher should ask the child what they would like to do

B. Ignoring

Ignoring problem behavior is to be used when it is apparent that the child is engaging in problem behavior to gain an adult's attention. This strategy is best used when:

(a) the problem behavior can actually be ignored (i.e., it is not dangerous, peers are not attending to it),

(b) it is likely that the child will engage in an appropriate alternative when it is clear that the problem behavior "is not working," or

(c) the entire classroom of teachers agree and commit to this strategy in advance for a particular child's specific problem behavior.

Note: Do not remind children of classroom rules and then attempt to ignore problem behavior.

13. Ignoring problem behavior is to be used when:

    a. the teacher has no other option

    b. the child has not had enough sleep the night before

    c. the child is hungry

    d. the child is engaging in problem behavior to gain an adult's attention

Note on Individualized Protocol

When a pattern of problem behavior has emerged for a particular child, all teachers will be asked to implement specific behavior-management strategies in an attempt to determine which aspect(s) of the behavior management program is worsening problem behavior (i.e., making it more likely) or which features may be arranged to strengthen desirable alternatives to problem behavior. Individualized programs will note specific proactive and reactive strategies for specific topographies of problem and desirable behaviors. In addition, more individualized procedures for collecting behavioral data may be made available.

Often Ineffective or Detrimental Strategies

1. "Ignoring" behaviors that serve to escape
2. Saying "No" or "stop" following undesirable behavior and not pairing the reprimand with some type of reinforcer omission or delay
3. Providing choices after noncompliance
4. Prompting children to use their words immediately following problem behavior
5. Reminding children of the "rules" following problem behavior and that reminder is paired with reinforcement for breaking the rule in the form of immediate, additional teacher attention or access to an alternative activity (i.e., reprimands or descriptions of desirable alternatives following problem behavior should be paired with at least a brief delay to classroom reinforcers).
6. Redirection to another activity, if the activity represents an improvement for

the child

7. Extended discussions or negotiations of problem behavior with children
8. Proactive strategies without reactive strategies
9. Reactive strategies without proactive strategies

14. Some ineffective or detrimental strategies are:

a. proactive strategies without reactive strategies

b. prompting children to use their words immediately following problem behavior

c. “ignoring” behaviors that serve to escape

d. all of theses are ineffective or detrimental strategies

Answers

1. A
2. D
3. A
4. B
5. A
6. D
7. D
8. A
9. B
10. D
11. D

12. B

13. D

14) D

Appendix D

Behavior Descriptions

Problem Behaviors

Aggression (towards others)	Motor disruptions	Vocal disruptions	Others
kicking	spitting	yelling or	Inappropriate
hitting	throwing items	screaming	touching
pinching	tearing books	while indoors	
shoving	swiping items off tables	which was not	
spitting	kicking items	prompted by	
forceful	knocking over structures	the teacher (as	
grabbing	grabbing materials from	in a circle	
scratching	others	activity)	
biting	placing objects in the	swearing	
throwing	toilet or trash that do not	rudeness (to	
things	belong	teachers or	
	running away	peers)	
	standing on furniture	name-calling	
	sitting on tables		
	opening classroom doors		

Desirable Behaviors

Note: The desirability of a given behavior depends on the child's development (i.e., current behavioral repertoire). For example, pointing may be an appropriate means of obtaining an object for a 2 year-old if the typical response under those conditions is crying. However, pointing would be less desirable for a child who typically requests items using 2 to 3 word sentences. Nevertheless, generally desirable forms of behavior are noted below.

Using words (approp. tone and volume) to obtain the things	Sharing toys or other materials
Using words (approp. tone and volume) to resolve conflicts	Waiting patiently or tolerating delays to the upcoming activity
Requesting help or assistance with difficult tasks or situations	Lining up behind another student without touching the student
Requesting to take a break from or leave a non-preferred or unpleasant situation	Putting materials away at clean-up time following a single prompt
Saying "Excuse me" to gain others attention	Playing/working independently during Centers or Free-choice
Saying "Excuse me" to gain access to an area that is blocked by others	Playing/working cooperatively
Complying with specifically directed teacher instructions or requests	Helping others
	Demonstrating a new skill
	Independently completing a self-help skills
	Defending rights and materials

Complying with nondirective prompts	appropriately
Following instructions delivered to a group	Initiating interaction and play with peers
Sitting w/ legs crossed and hands in lap during circle	Involving others in pretend play
Being gentle with friends or materials	Smiling