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EFFECTS OF RESPONDING TO A NAME AND GROUP CALL ON PRESCHOOLERS' COMPLIANCE

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We assessed teacher–child relations with respect to children's name calls, instructions, and compliance in a preschool classroom. The most frequent consequence to a child's name being called was the provision of instructions. We also observed a higher probability of compliance when children attended to a name call. Next, we evaluated the effects of teaching preschoolers to attend to their names and a group call on their compliance with typical instructions. We used a multiple baseline design across subjects and a control-group design to evaluate whether gains in compliance were a function of treatment or routine experience in preschool. Results showed that compliance increased as a function of teaching precursors for all children in the experimental group, and the effects on compliance were maintained despite a reduction of the occurrence of precursors. Moreover, it appeared that precursor teaching, not routine preschool experience, was responsible for the changes in compliance.

Key words: compliance, maintenance, noncompliance, precursors, preschool children

Over the past two decades, school readiness has been a prominent topic among policy makers, researchers, and educators (National Institute of Child Health and Human Development [NICHD], 2003). Lin, Lawrence, and Gorrell (2003) conducted a survey of kindergarten entry-level skills with 2,845 kindergarten teachers and found that 78% of teachers rated compliance as a very important component of school readiness. Rimm-Kaufman, Pianta, and Cox (2000) conducted a survey of teachers' judgments of problems transitioning to kindergarten and found that 46% of teachers reported that half or more of their students entered kindergarten with difficulty following directions. Teachers continue to report that many children exhibit noncompliance in the classroom despite the prevalence of research that has described effective tactics to improve compliance (Houlihan, Sloane, Jones, & Patten, 1992).

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The research-to-practice gap might be related to low acceptability of the various interventions for addressing noncompliance. Teachers may be more likely to implement interventions that they consider to be acceptable (Wolf, 1978), and conducting comprehensive social validity assessments would provide evidence of whether interventions are accepted by teachers. In addition, although researchers have described numerous tactics to improve compliance by individual children, there is a need for simple and effective tactics to promote compliance with groups of children. Atwater and Morris (1988) observed that group instructions increased substantially from preschool to first grade. The limited research that has described methods to improve compliance with groups of children often involves the implementation of complex classwide programs (e.g., Glass, Houlihan, Fatis, & Levine, 1993) or targets specific activities (e.g., transitions; Goetz, Ayala, Hatfield, Marshall, & Etzel, 1983). The design of procedures that incorporate individual and group instructions, are socially acceptable, and are implemented easily yet still are effective, may help to close the apparent research-to-practice gap.

Even still, some teachers have been taught that children's compliance will improve with

age, and some research supports the notion that compliance often improves without intervention as a function of other naturally occurring factors associated with time. For instance, positive correlations between children's age and compliance levels have been reported frequently (Hanley, Heal, Tiger, & Ingvarsson, 2007; Kuczynski, Kochanska, Radke-Yarrow, & Girnius-Brown, 1987; Stephenson & Hanley, 2010). Although compliance may increase without deliberate teaching or programming for some children, other analyses show that increases in compliance may not be observed with many children without intervention (Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998; NICHD, 2003; Vandell et al., 2010). For example, the NICHD (2003) reported a positive correlation between the time spent in nonfamilial care during the first 4.5 years of life and reports of noncompliance. Vandell et al. (2010) detected similar relations in a follow-up study when the same children were assessed again at age 15 years, suggesting that the impact of nonfamilial early childhood care influenced the likelihood of problem behavior through adolescence. Because noncompliance learned during nonfamilial child care does not necessarily decrease as children age, prevention programs aimed at decreasing the likelihood of developing and persisting noncompliance are needed.

Noncompliance prevention strategies also are important because nonfamilial care is prevalent. Of the children entering kindergarten in 1998, West, Denton, and Germino-Hausken (2000) reported that four in five regularly received care from a nonfamilial caregiver prior to entering kindergarten. The prevalence of nonfamilial care, and the associated risk of developing problem behavior including noncompliance, prompted Hanley et al. (2007) to develop a curriculum for teaching social skills in preschool classrooms to promote school readiness and to minimize the likelihood of problem behavior during early school years. They divided the curriculum, referred to as the preschool life skills (PLS) curriculum, into four units. These units were composed of skills that teachers reported to be important for school readiness, including instruction following, functional communication, delay tolerance, and friendship skills. Each unit contained two to four skills that were taught sequentially via instructions, modeling, role-play, and feedback in a classwide format to 16 preschoolers at a university-based preschool. The first unit, instruction following, was the most relevant to our study and contained three skills: (a) responding effectively to one's name, (b) following simple individual instructions, and (c) following multistep individual instructions (group instructions were not included). Of the 16 children involved in the study, 12 responded effectively to their names during 100% of trials, 14 complied with simple instructions during 100% of trials, and 12 complied with multistep instructions during 100% of trials following implementation of the classwide curriculum, which represented about a four-fold increase from baseline. Similar effects were observed when the classwide curriculum was evaluated later in two community-based Head Start preschools (Hanley, Fahmie, & Heal, in press).

Although the PLS curriculum was designed such that each skill would promote the development of the next (Hanley et al., 2007), the impact of teaching early skills on the development of later skills was not evaluated. For instance, it is not known whether learning the initial skill (i.e., an effective response to one's name) has any effect on the development of the second and third skills in the curriculum (i.e., following simple and multistep instructions). The skills were taught sequentially and, although baseline probes of skill groups were scheduled intermittently, baseline probes were not conducted after teaching each skill (e.g., probes of the second and third skills were not conducted after the first skill had been taught). For that reason, neither the data from Hanley et al. (2007) nor the replication study (Hanley et al., in press)

demonstrate the impact of teaching children to respond effectively to their names on the probability of compliance. However, the detection of a positive relation would be important because teachers would be able to use this relatively easy and benign strategy to increase preschooler compliance.

Kraus, Hanley, Cesana, Eisenberg, and Jarvie (2012) evaluated the effects of differentially reinforcing responding to one's name call on compliance (a low-probability behavior) with individual instructions with two preschoolers of typical development. Responding effectively to one's name was referred to as *precursor behavior* (the response following a name call was conceptualized as being a component in a complex chain of behavior associated with compliance, thus being a precursor to compliance). Precursors consisted of a child stopping the current activity, orienting towards the teacher, making eye contact, and saying "yes" within 2 s of a name call. The intervention consisted of the delivery of tokens contingent on the emission of all four precursors. The consequences for compliance and noncompliance (praise and ignore, respectively) remained the same during baseline and treatment. The authors found that differential reinforcement effectively increased precursors for both children, and they observed a concomitant increase in compliance even though the consequences of compliance and noncompliance remained unchanged. These data provide evidence that teaching the initial preschool life skill had a positive impact on the development of subsequent skills in the PLS instruction-following unit.

Kraus et al.'s (2012) study, however, was limited in several ways. First, they used tokens, exchangeable for child-led play time, as the consequences for emitting precursors. Although this reinforcement tactic was acceptable to the teachers of the two children in their study, the more widespread use of this intervention may be limited because of some teachers' reluctance to use token-reinforcement programs in the classroom (Axelrod, Moyer, & Berry, 1990). Second, the authors did not eliminate the delivery of tokens for precursors. Therefore, we cannot determine how long the effects on compliance would have maintained absent the reinforcement programmed for precursors. In addition, because tokens were not eliminated, it is unclear whether the effects on compliance were a function of strengthening precursors or whether the mere inclusion of the tokens in the instructional context increased compliance through some other behavioral process. As Ingvarsson, Hanley, and Welter (2009) demonstrated, the delivery of a preferred item prior to an instruction may be just as effective in increasing compliance as delivering the preferred item contingent on compliance. Third, although the teachers in Kraus et al. reportedly found the experience helpful, the authors did not directly evaluate the social acceptability of the procedures.

We designed the current set of studies to address the limitations of the previously cited research. In Study 1, we conducted a descriptive assessment to determine (a) the prevalence of name calls in a preschool classroom, (b) children's typical responses to their name calls, (c) the type of events that most often followed children's name calls, and (d) the probability of compliance with instructions in the preschool classroom given the children's different responses to their name calls. In Study 2, we conducted an experimental evaluation of the effects of strengthening a response to a name (referred to as a precursor) and group call on compliance. To extend Hanley et al. (2007, in press), we selected participants who were reported to have (and then displayed) consistently low levels of compliance. To extend Kraus et al. (2012), we used praise and readily available activity materials as reinforcers for precursors instead of tokens to potentially increase the acceptability of the procedures. We also made these same materials available noncontingently in baseline to isolate the effects of the mere presence of putative reinforcers

from the contingent use with the precursors. In addition, we removed the teaching procedures for precursors and continued to measure compliance for an extensive time period. The extended maintenance condition allowed us to evaluate the long-term effects of learning to respond effectively to a name and group call on compliance, which had not been done in the aforementioned studies. Because of our emphasis on the long-term effects of treatment on compliance and the possibility that compliance improves with age, we also used a matched control group to determine whether observed changes in compliance were a function of our treatment or were simply a result of time spent in a preschool classroom with experienced teachers. To expand on the limited number of studies that have targeted compliance with group instructions, we taught the children to respond to a group call (i.e., "everyone!") and evaluated the effects of teaching precursors to the group call on compliance with group instructions; this was done in a small-group format. Finally, we conducted a comprehensive social validity assessment of the intervention goals, procedures, and outcomes.

STUDY 1

Method

Participants and setting. Participants included 17 children of typical development and two teachers in a community-based preschool classroom. The children ranged in age from 4 to 5 years old. All children were reported to exhibit age-appropriate receptive language skills and were able to understand one-step instructions. The classroom staff consisted of one lead teacher and one assistant teacher. Both teachers were informed that the purpose of the study was to observe teacher–child interactions and were instructed to behave as they typically would. Both teachers had been employed at the preschool for over 10 years.

Observations were conducted in two locations—the main classroom and an indoor activity room—and during four activities: free play, center activities, circle time, and lunch. Free play consisted of a 30-min period in which six activities (e.g., dramatic play) were simultaneously available. Center activities consisted of a 30-min period in which four different fine-motor activities (e.g., art) were available. The fine-motor activities were set up on four separate tables, and the children rotated among the tables. Circle time consisted of a 45-min floor activity led by a teacher. All of the children sat in a semicircle, and the teacher engaged them with songs, stories, and gross-motor activities. Lunch consisted of a 30-min period of family-style dining. Small groups of children sat at tables. Children served themselves and passed food to peers.

Measurement. Observations were conducted during 10-min sessions. Observers used a data sheet partitioned into 30-s intervals to record data on teacher–child interactions. A discontinuous recording procedure was used to record the first instance of a vocalization of a child's name in each 30-s interval. Data were not collected on name calls that occurred after the first instance within a 30-s interval so that observers were able to observe and accurately record relevant teacher and child interactions during this period. Data were collected via pen and paper. Observers used dictaphones with a prerecorded vocalization of the specific 30-s intervals to aid in detecting these intervals. They also used ear buds to decrease interference of the prerecorded voice with ongoing classroom activities. Observers collected data approximately 2 m from teachers and children, and did not initiate interaction with children or teachers during observations. One teacher was observed during each 10-min observation period, and observers collected data on any child the teacher called (i.e., specific children were not targeted for observation; one teacher was observed, and data were collected following name calls emitted by the teacher). A total of 42

observations resulted in 7 hr of observation (5 hr for the lead teacher and 2 hr for the assistant teacher).

Measures were divided into two main categories: teacher behavior and child behavior. Measures of teacher behavior included the call of a child's name (which initiated each instance of data collection) and behavior following the call of a child's name. The behavior after the call of a child's name was divided into four categories: (a) the delivery of an instruction to a child, (b) the delivery of attention to a child, (c) the delivery of tangible items to a child, and (d) no behavior directed towards the child whose name had been called (labeled "nothing"). *Instructions* were defined as directives delivered within 3 s of a name call. *Attention* was defined as the delivery of praise (e.g., "nice job!"), or a description of the child's environment (e.g., "That bear looks happy!") within 3 s of a name call. *Tangible* was defined as a teacher delivering an object (e.g., a toy or materials) to a child within 3 s of a name call. *Nothing* was defined as a teacher not delivering an instruction, attention, or tangible within 3 s of a name call (e.g., the teacher began attending to a different child).

Measures of child behavior were divided into two main categories: a child's response to his or her name call and a child's response to teacher instructions. A child's response to his or her name call included stopping the activity, looking at the teacher, saying "yes," or ignoring. *Stopping the activity* was defined as a child either not engaging in any competing activity or stopping the engagement in the prevailing activity within 3 s of the name call. *Looking at the teacher* was defined as a child looking at the teacher who called the child's name within 3 s of the name call. *Saying "yes"* was defined as the child saying "yes" within 3 s of the name call. *Ignoring* was defined as a child not stopping the activity, not looking at the teacher, or not saying "yes" within 3 s of the name call. A child's response to teacher instructions included compliance and noncompliance. *Compliance* was defined as initiation or completion of the teacher-stated instruction within 15 s of the instruction. *Noncompliance* was defined as not initiating or not completing the teacher-stated instruction within 15 s of the instruction.

Interobserver agreement. Interobserver agreement data were collected during 62% of observations and were calculated using trial-by-trial agreement (i.e., an agreement was scored when two observers either circled or did not circle the same code in the same interval). Interobserver agreement, determined by dividing agreements by agreements plus disagreements and converting the result to a percentage, averaged 95% across measures (range, 87% to 100%). The mean agreement that a name call occurred was 92%. The mean agreement of the specific child action following a name call was 89%. The mean agreement of teacher action following a name call was 88%. The mean agreement of child action following an instruction was 87%.

Results and Discussion

During the 7 hr of observation, children's names were called 298 times. Figure 1 (top) depicts the percentage and count of teacher behavior that occurred after a name call. The most frequent consequence of a name call was an instruction and was observed after 71% (212 occurrences) of total name calls; followed by nothing (e.g., a teacher began attending to a different child), which was observed after 19% (57 occurrences) of total name calls; then attention, which was observed after 9% (27 occurrences) of total name calls; and finally tangible, which was observed after 1% (two occurrences) of total name calls.

Figure 1 (middle) depicts the percentage and count of child behavior after a name call. The most frequently observed child behavior after a name call was stopping the activity and looking at the teacher, which occurred during 56% (166 occurrences) of total name calls; followed by ignoring, which was observed during 21% (61 occurrences) of total name calls; stopping

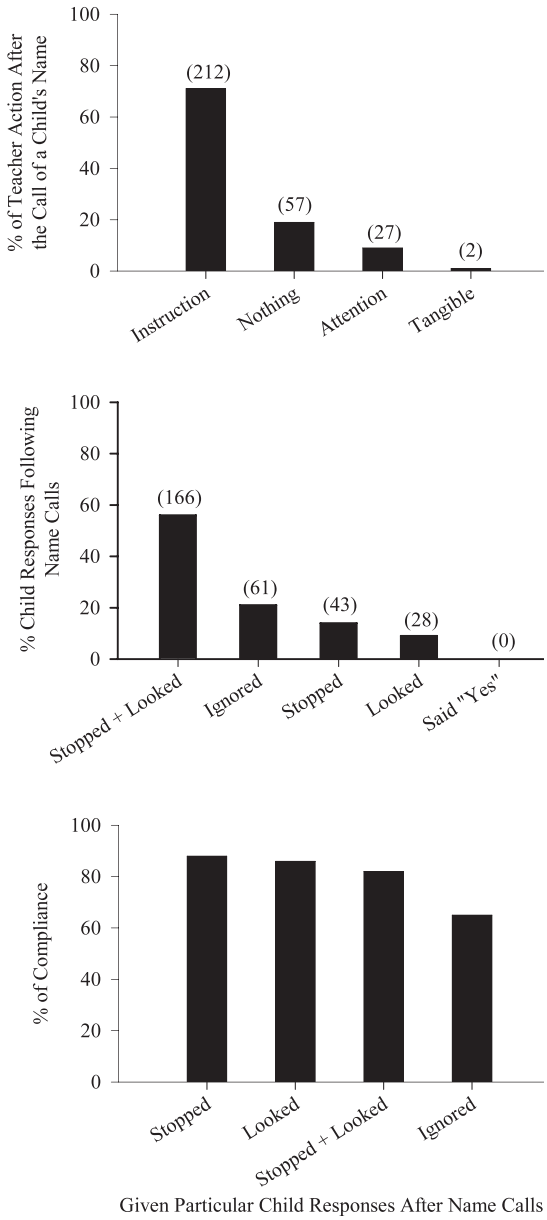

Figure 1. The top panel depicts the percentage of particular teacher behaviors that occurred after a teacher called a child's name; the count of each behavior is denoted in parentheses. The middle panel depicts the percentage of particular child behaviors that followed name calls; the count of each particular behavior is denoted in parentheses. The bottom panel depicts the percentage of compliance with an instruction given a particular child behavior after his or her name call; each percentage was derived from the total occurrences of each particular child behavior.

the activity, which occurred during 14% (43 occurrences) of total name calls; and looking at the teacher, which occurred during 9% (28 occurrences) of total name calls. Throughout the study, no child said "yes" after a name call.

Compliance or noncompliance could not be scored on 57 of the occurrences of an instruction because the child left the observation area (e.g., he or she went to the restroom). The 57 occurrences of instruction that were not scored were removed from the instruction total when compliance was calculated, resulting in 155 instructions scored for compliance or noncompliance. Compliance with an instruction was observed for 81% of the 155 instructions recorded. Figure 1 (bottom) depicts the percentage of compliance observed when children engaged in the different responses after their name calls. Compliance occurred with 82% of instructions when a child stopped and looked at the teacher after a name call (77 of the 94 stop-and-look occurrences); compliance occurred with 88% of instructions when a child stopped but did not look at the teacher after a name call (21 of the 24 stop occurrences); compliance occurred with 86% of instructions when a child only looked at the teacher after a name call (12 of the 14 look occurrences). By contrast, compliance occurred with only 65% of instructions (15 of the total 23 ignore occurrences) when a child ignored the teacher after a name call.

This assessment allowed us to appraise the skills taught in Unit 1 of the PLS curriculum (Hanley et al., 2007) and to identify the probability of naturally occurring consequences following a child's name call in a preschool classroom. The assessment showed that instructions were the predominant event following a child's name call and that a child stopping an activity, looking at the teacher, or both were more predictive of compliance relative to a child ignoring a name call. These results imply that strengthening a response following a name call may enhance compliance with instructions.

One explanation for the maintenance of ignoring a teacher's name call is the possibility of escape from instructions or avoidance of the termination of the existing activity. The instruction delivery likely represents a worsening of the environment, and the instruction delivery may function as a reflexive conditioned establishing operation (CEO; see Michael, 2000). Therefore, the child may be more likely to avoid both the delivery of instructions and termination of existing activities if the teacher's name call is ignored.

Finally, this study entailed a descriptive assessment of naturalistic conditions (i.e., manipulations to the environment were not conducted), and functional relations between the name responses and compliance cannot be derived from our results. In other words, we cannot determine if a child stopping the activity and looking at the teacher after a name call were functionally related to higher levels of compliance. In addition, our results only inform as to what was observed in this particular classroom; response relations may vary with other children and classrooms. To address the main limitation in Study 1 and to expand on the existing literature in this area, we conducted an experimental analysis of compliance and children's varying responses following their name calls.

STUDY 2

Method

Participants and setting. Twelve typically developing children from two classrooms in the same community-based preschool participated. Four children from one of the classrooms also participated in Study 1. The children ranged in age from 3 to 5 years old (see Table 1). Classroom teachers reported that all children displayed age-appropriate receptive and expressive language skills and could complete simple and multistep instructions, but that these children engaged in the lowest levels of compliance in their classrooms. Prior to the start of the study, we obtained approval for the project through an institutional review board and obtained parental consent for all participants. On a daily basis, the first author obtained assent from each participant by asking each if he or she wanted to work with her. If the child refused at any time, he or she was allowed to return to activities with the class for the remainder of the day. The classroom staff were present throughout the study, but did not participate. The first author conducted all sessions in a small-group format in the children's classrooms.

Table 1
Participants, Classroom Placement, Noncompliance Rank, Group Assignment, and Ages at the Onset of Baseline

Child	Classroom	Rank	Group	Age (in years)
John	A	1	Experimental	4.4
Cole	A	2	Control	5.4
Earl	A	3	Experimental	4.5
Gina	A	4	Control	4.6
Jim	A	5	Control	4.7
Lisa	A	6	Experimental	4.3
Pat	A		Control	4.5
Joe	B	1	Experimental	4.5
Bob	B	2	Control	3.7
Brad	B	3	Experimental	4.5
Jan	B	4	Control	4.0
Ken	B	5	Experimental	4.0
Carl	B	6	Control	4.5
Dan	B		Control	3.9

Response definitions and measurement. Observers collected data on precursor behavior and compliance via paper and pencil either live or via videotape. We defined a *precursor* as a child stopping the current activity, looking at the experimenter, saying "yes," and waiting for a response from the experimenter who had called his or her name. We defined *stopping* as a child no longer manipulating activity-related materials within 3 s of the name call. We defined *looking* as a child making eye contact with the experimenter who called his or her name within 3 s of the name call. We defined *saying* "*yes*" as a child saying "yes" within 3 s of the name call. We defined *waiting* as a child maintaining the

stop-and-look response until the experimenter issued an instruction. We defined *compliance* as a child completing the instruction delivered by the experimenter within 6 s of the instruction (Stephenson & Hanley, 2010). The time criterion for compliance during Study 2 (i.e., 6 s) was different from Study 1 (15 s) because all the instructions in Study 2 were one-step instructions, and they could be completed within 6 s. The instructions in Study 1 were not controlled, in that we observed the children's teachers delivering their typical classroom instructions, which included a variety of multistep instructions.

Interobserver agreement. We collected interobserver agreement data, either live or via video, for 41% of all sessions, with at least 20% collected in each condition. Data were collected on the occurrence and nonoccurrence of stopping, looking, saying "yes," waiting, compliance with individual instructions, and compliance with group instructions. We scored an agreement when two observers coded the same trial in the same way. We calculated interobserver agreement by dividing the total number of agreements per trial by the total number of agreements plus disagreements and converting the result to a percentage. The mean agreement across all dependent measures was 96%; the lowest mean was 86%.

Design. We used two designs, a single-subject design and a between-subjects design, to evaluate the effects of our teaching package. A multiple baseline design across subjects allowed us to evaluate the effects of the teaching package on precursors and precursors on child compliance. The between-subjects design, which included matched and random assignment to groups, allowed us to evaluate whether compliance might have increased as a function of other factors associated with time by comparing the behavior of children who received the teaching package to the behavior of children who did not.

To conform to random and matched assignment (Keppel & Zedeck, 1989), the first author asked the lead teacher of both classrooms to rank the children from the least likely to comply with instructions to the most likely to comply. We selected the six children from each classroom who were reported to engage in the lowest levels of compliance to participate. We used teacher report to identify which children would benefit most from an intervention to improve compliance. Levels of compliance were then assessed directly during the initial baseline to confirm that the selected children did in fact exhibit low levels of compliance. We paired the two children who engaged in the lowest levels of compliance (ranked 1 and 2), the next two children who engaged in the lowest levels of compliance (ranked 3 and 4), and the final two children who engaged in the lowest levels of compliance (ranked 5 and 6) to form three pairs in each classroom. In Classroom A, we then randomly assigned one child from each pair to the first experimental group and the other child to the control group. In Classroom B, we purposely assigned children to experimental and control conditions based on the baseline mean compliance levels that resulted in the experimental and control groups from both classrooms having similar overall compliance levels. Thus, we had four groups with three children in each group (an experimental and a control group in Classroom A, and an experimental and a control group in Classroom B; see Table 1 for ranking and group assignment).

At different points in the study, parents of three children from the control group terminated their children's enrollment at the preschool for reasons unrelated to the study. On two of these occasions (once for Classroom A and once for Classroom B), we asked the lead teacher in each classroom to identify the child who exhibited the lowest level of compliance in the classroom who was not currently involved in the study. These students took part in the control groups in their respective classrooms. On the third occasion, which occurred during the last condition, we included one of four

additional children from the classroom to maintain a consistently sized small-group format and did not collect data on his behavior.

Baseline. Session contingencies were the same for the control and experimental groups. Both the experimental and control groups experienced the same number of baseline sessions. Sessions across groups were conducted separately, but sessions for all groups occurred on the same days (i.e., we first conducted one to three sessions with the experimental group and then conducted one to three sessions with the control group or vice versa). Baseline sessions were trial based, and the duration of each session varied depending on the duration of trials. Session duration was typically 20 min, with a range from 15 min to 30 min across the study.

Sessions were set up to simulate various typical classroom activities and included three general categories (art, building, and transitions) that were counterbalanced across sessions. The experimenter initially presented the materials and modeled the proper use. All subsequent activities were child directed. The experimenter provided assistance with the activity as children requested. During each session, five individual name-call trials for each child were interspersed with five group-call trials. During an individual name-call trial, the experimenter called the child's name, waited 3 s, and delivered an instruction. During the group-call trial, the experimenter called "everyone," waited 3 s, and delivered an instruction. All instructions were simple one-step instructions.

The specific instructional categories and frames are included in Table 2 and are based on those typically delivered in preschools (Stephenson & Hanley, 2010). It is important to note that a name call or group call was not considered an instruction in our analysis. Instructions were delivered 3 s after a name or group call. The experimenter provided descriptive praise following correct precursors (i.e., stopped, looked, said "yes," and waited within 3 s). The descriptive praise occurred after compliance with the instruction or 6 s, whichever came first (the descriptive praise for the precursor occurred after compliance or 6 s [the end of the trial] so that the praise did not affect the initiation of compliance with an instruction). Descriptive praise was provided for compliance. The experimenter ignored (i.e., continued with the trial and did not vocally or physically address) all incorrect or absent precursors and noncompliance. The experimenter allowed approximately 30 s to elapse (from the last instruction or the last compliance, whichever came later) before another instruction was delivered to the same child (i.e., there was at least 30 s between instructions during the activities). Five noncontingent social or tangible rewards (typical preschool appetitive stimuli) were delivered to each child throughout each session to serve as a control for the response-dependent rewards delivered in teaching. Rewards consisted of 5 s of individualized attention such as vocal praise statements, hand jives (e.g., high fives, thumb wars, secret

Table 2
Instructional Frames

Category	Frame
Gross motor	Put the — in the box.
	Hand me [child] the —.
	Put the — on the —.
	Perform motor action: clap hands, stand up, sit down, arms up.
	Pass the — to —.
	Pick up the —.
Fine motor	Put — in [on] the —.
	Glue the —.
	Draw a [circle, triangle, square].
	Pick up a —.
	Color — (teacher points to area).
Self-help	Wipe your hands with wet wipe [napkin].
	Put the — in [on] the —.
	Give me the [a] —.
	Wipe the table with the wet wipe.
Concept formation	Give me a [color] [object].
	Put a — in my hand.
Vocal responses	What color is the —?
	What shape is that? (pointing to shape)

Note. Adapted from Stephenson and Hanley (2010).

handshakes), supplementary material for the activity (e.g., glitter for an art project or animals for a building project; each activity started with the bare minimum materials, and the activity materials were added throughout the session), or occasionally a sticker. These rewards were delivered intermittently throughout each session, were not contingent on any particular response, and were not delivered immediately before (within 10 s) or immediately after (within 10 s) a trial.

Teaching Precursors A (without instructional demands). The purpose of this condition was to teach the children to engage in precursor behaviors. The experimental groups in Classrooms A and B experienced this condition. Teaching sessions were similar to baseline with respect to the activity format, but a multicomponent teaching package was introduced that included instructions, modeling, role-play, feedback, and intermittent contingent rewards to teach the precursors. Instructional demands were absent in this condition because the purpose was to teach precursor behaviors. Therefore, compliance could not be measured.

Immediately prior to the start of each session, the experimenter led a presession role-play. During the role-play, the group was instructed to stop their activity, look at the experimenter, say "yes," and wait for the experimenter to respond following a name call. Each child then practiced the precursor. The experimenter either (a) delivered descriptive praise contingent on a correct precursor or (b) allowed the child to practice the skill again contingent on an incorrect precursor. The group was then instructed to respond to "everyone," and practice was provided in a similar manner. The session began immediately after the practice trials.

Each child experienced 15 trials during each session. Five trials were initiated when the experimenter called a child's name, and correct precursors were followed by descriptive praise. Five trials were initiated when the experimenter called "everyone," and correct precursors were followed by descriptive praise. Five trials were initiated when the experimenter called either the child's name or "everyone," and correct precursors were followed by a reward (these trials replaced the noncontingent rewards delivered in baseline). In Study 1, we observed that the most frequent event to follow a name call was an instruction. Therefore, we provided rewards after a portion of name and group calls so that name or group calls would not become predictive of instruction delivery and potentially become an aversive stimulus. During some sessions, rewards were delivered less often in the teaching session than in the previous baseline sessions because the rewards were delivered contingent on correct precursors.

Throughout each teaching session, if the child did not engage in a correct precursor after an individual name call, the experimenter described the situation-specific behavior to the child and role-played until the child engaged in a correct precursor. If a child or children did not engage in a correct precursor after a group call, the experimenter first praised, and sometimes rewarded, any child who engaged in a correct precursor, and then described the expected situation-specific behavior to the children who did not engage in a correct precursor.

Ten additional practice trials were conducted prior to Sessions 12 to 27 for Lisa and Sessions 27 to 57 for Joe due to the delay in acquisition of their precursors. During the practice trials, the experimenter sat at the table with the child and conducted the trials as in the reward trials described above. The additional practice trials were terminated at the start of the next condition.

Finally, the control group was not exposed to teaching conditions. While the experimental group was experiencing precursor teaching, the control group participated in regularly scheduled classroom activities.

Teaching Precursors A (with instructional demands). The purpose of this condition was to continue to teach the children to engage in

Table 3
Critical Components of Conditions

	Consequences for target behaviors				
	Compliance	Noncompliance	Precursor	Incorrect or absent precursors	Reward delivery
All baselines	Praise	Ignore	Praise	Ignore	Noncontingent (five deliveries)
Teaching Precursors A (without instructional demands)	Praise	Ignore	Praise, rewards	Feedback, role-play	Contingent (up to five deliveries)
Teaching Precursors A (with instructional demands)	Praise	Ignore	Praise, rewards	Feedback, role-play	Contingent (up to five deliveries)
Teaching Precursors B	Praise	Ignore	Praise	Feedback, role-play	Noncontingent (five deliveries)

precursors while the instructional demands were reintroduced to evaluate the effects of teaching on compliance. The experimental groups in Classrooms A and B experienced this condition. This condition began after each child participated in at least 10 teaching sessions (without instructional demands) in which all three children in the group were present and engaged in precursors on or above 80% of trials. All procedures remained the same except that instructional demands were now issued during five trials in which a child's name was called and five trials in which the group was called (10 opportunities for compliance, which was the same as baseline). The five reward trials continued in this condition; there were 15 opportunities to engage in precursors just as in Teaching Precursors A (without instructional demands). The instructional frames were the same as those delivered in baseline (see Table 2).

Teaching Precursors B. The purpose of this condition was to reteach the experimental group in Classroom A to engage in precursor behaviors, because engagement in precursor behavior decreased below acceptable levels after baseline was reintroduced. (The groups in Classroom B did not participate because the school year ended prior to implementation.) During this condition, we retaught the precursors with only feedback and role-play (we no longer delivered the presession instructions and modeling) so that the precursors would be more likely to come under the control of the associated consequences of engaging in the responses. We hypothesized that this might lead to better maintenance of the precursors in a subsequent return to baseline. Sessions remained similar to baseline except that the experimenter reminded the child of the situation-specific behavior and provided a practice opportunity if the child did not engage in the precursor behavior. Each child experienced 10 trials (five name calls and five group calls followed by an instruction). The five contingent reward trials were not included in this condition, but five noncontingent rewards were delivered throughout each session. After precursors had returned to levels similar to the previous teaching phase, we slowly faded the feedback by first providing feedback for every other incorrect precursor and then every third, and then baseline was reintroduced (see Table 3 for a summary of conditions).

Social Validity Assessment

Five respondents were selected to assess the importance of the behaviors targeted for change, the acceptability of teaching procedures, and their satisfaction with the children's performance by viewing video footage and completing a questionnaire. The five respondents included two teachers from the classrooms in which the study took place, the director of the preschool, the executive vice

Table 4
Questions and Results of the Social Acceptability Questionnaire Administered to Stakeholders

Questions	Responses	
	Mean (range)	
1. Do you think that following instructions is a valuable skill for children?	6.8 (6–7)	
2. Do you think that teaching instruction following is likely to increase a child's success in school?	6.8 (6–7)	
3. Do you think a child attending when his name is called is a valuable skill for children?	5.8 (5–7)	
4. Do you think that teaching children to attend when their name is called is likely to increase a child's school success?	6 (5–7)	
	Baseline 1 video	Baseline 2 video
5. Are you satisfied with the way these children paid attention to their name?	3.4 (2–5)	5.6 (5–7)
6. Do you think the way these children paid attention to their name would be appreciated at school?	3.6 (1–7)	6.2 (5–7)
7. Are you satisfied with the way these children followed instructions?	3.4 (1–5)	6.6 (6–7)
8. Do you think the way these children followed instructions would be appreciated at school?	3.8 (1–7)	6.6 (6–7)
	Teaching component video	
9. Do you think these teaching procedures are acceptable for a school setting?	6.6 (6–7)	
10. Would you recommend these teaching procedures to others?	6.8 (6–7)	

Note. The five respondents used a 7-point Likert scale with the following ratings: 7 = *strongly agree,* 4 = *no opinion,* 1 = *strongly disagree*.

president of the organization to which the preschool belonged, and a preschool teacher from a different preschool classroom who had no involvement with the project. All respondents were given a questionnaire regarding the social acceptability of the goals, procedures, and results (see Table 4). After answering general questions (Questions 1 through 4), respondents viewed a video of the children from Classroom A prior to and after teaching and then were asked to answer questions regarding the children's performance. The respondents were unaware of the condition they were observing, the purpose of the study, and teaching procedures. Respondents completed the questions regarding one video before viewing the next. They viewed the first 5 min of the first videotaped sessions of Baselines 1 and 2 (i.e., videos of children before and after teaching) that were clearly audible with no visual obstruction, and each video sample included at least three opportunities to assess each skill (three name calls, group calls, and instructions). Next, they viewed a 2-min video sample of the teaching condition that depicted each component and answered questions regarding the acceptability of the procedures.

Results and Discussion

Was the teaching package effective for teaching precursors? The effects of the teaching package on the levels of precursors is depicted in Figure 2 (left), which shows the percentage of trials in which precursors occurred across sessions for all children in the experimental group. Consistent with a multiple baseline design, implementation of the teaching procedures was staggered across groups to evaluate whether the procedures had an effect on the levels of precursors. Precursors were at a low level during baseline and were acquired by children only when teaching procedures were introduced, as shown by the increasing trends following the phase lines. For example, John (Figure 2, top left) did not exhibit precursors during the initial baseline. After the Teaching Precursors A condition was implemented, level of precursors increased,

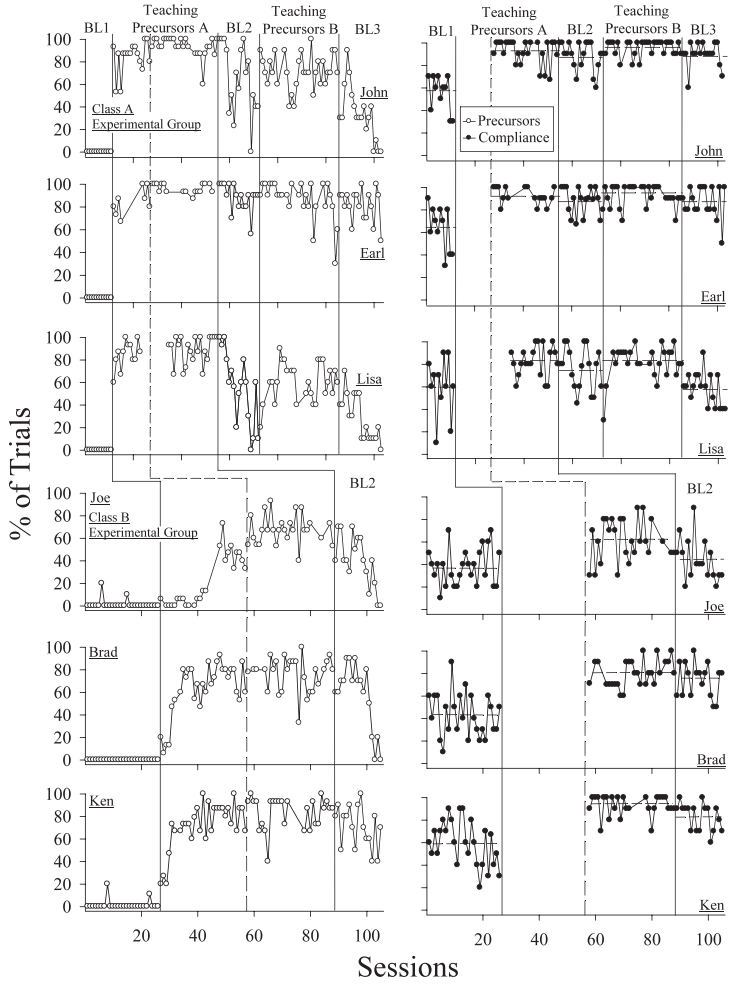

Figure 2. The left column depicts the percentage of precursors (open circles) during Baseline 1 (BL1), Teaching Precursors A, Baseline 2 (BL2), Teaching Precursors B, and Baseline 3 (BL3) for each participant in the experimental group. The dashed vertical line denotes when instructional demands were reinstated during the Teaching Precursors A condition. The right column depicts the percentage of compliance (filled circles) across conditions for each participant in the experimental group. The dashed horizontal line denotes the mean percentage of compliance per condition.

and this increase was maintained when instructional demands were reintrodued (denoted by the hashed vertical line). The other participants exhibited similar patterns of precursors. Thus, our procedures were effective for teaching precursors.

To what extent were precursors maintained when teaching procedures were removed? We returned to baseline conditions to evaluate the extent to which the levels of precursors would be maintained absent the teaching procedures. After the return to baseline, high levels of precursors initially persisted for all children in the experimental group (Figure 2). However, we observed more variability over time for two children (Earl and Ken), and precursors reduced to low (John and Lisa) or near-zero levels (Joe and Brad) for the remaining children. After precursors were retaught and feedback was faded for John, Earl, and Lisa, we observed similar

increases in variability (Earl) or reductions in the precursors to low levels (John and Lisa) in the return to baseline. Thus, precursors did not persist over time when the teaching procedures were either abruptly or gradually removed (Baseline 2 and Baseline 3, respectively).

To what extent did precursors affect compliance? Figure 2 (right) also depicts the percentage of trials with compliance across sessions for children in the experimental group. Despite no changes to the consequences for compliance or noncompliance throughout the teaching precursors conditions, levels of compliance increased across all children, and the variability decreased for Earl, Lisa, Brad, and Ken. Thus, we can tentatively conclude that teaching precursors affected compliance. Compliance increased 24% to 37% after precursors were taught, and this change occurred when and only when precursors were taught, as shown by the multiple baseline design.

To what extent was compliance maintained when the teaching procedures for precursors were removed? Despite the decrease in the levels of precursors when teaching was removed, compliance persisted at levels higher than those observed in baseline for five of six children in the experimental group (all except Joe; see Baseline 2 in Figure 2). There was, however, a slight decrease in compliance levels for the experimental group after the return to baseline. Compliance increased to the highest level when feedback was reintroduced and gradually faded for John, Earl, and Lisa. Compliance persisted for only John and Earl during the subsequent return to baseline (Baseline 3). The slight decrease in compliance that occurred after the return to baseline also occurred for John and Earl.

Were the improvements in compliance related to the teaching procedures or to the result of other factors in the classroom? The control group allowed us to evaluate changes in the levels of precursors and compliance when children continued with the typical classroom instruction and did not experience our teaching procedures. Figure 3 depicts precursors (left) and compliance (right) for all children in the control group (except the participant who withdrew from the preschool). The data from the children selected to replace the participant (and to maintain the small-group format) are not shown because they experienced only one baseline (therefore, comparisons across Baselines 1, 2, and 3 could not be made). All children in the control group exhibited low levels of precursors across all sessions during Baselines 1, 2, and 3. The consistently low levels of precursors across all baseline conditions (approximately 6 months) support the notion that children may not be likely to learn to engage in precursors if they experience typical classroom interactions. In addition, all children in the control group exhibited similar levels and variability of compliance across Baselines 1, 2, and 3 (Figure 3). The uniformity in variability and level of compliance across baseline conditions supports the notion that children's compliance will not necessarily improve when they experience only their typical classroom instruction.

Figure 4 depicts the mean performance of precursors and compliance for the experimental and control groups during Baselines 1 and 2, which occurred across 6 months. During Baseline 1, the control and experimental groups showed near-zero levels of precursors (range, 0% to 1%). Compliance also occurred at similar levels across experimental and control groups in the initial baseline. During Baseline 2, the experimental group showed a marked increase in the mean percentage of precursors (range, 39% to 88%) compared to the control group, who showed no change. The experimental group also showed a marked increase in compliance ($M = 75\%$; range, 43% to 88%), but increases in compliance were not observed for the control group ($M = 54\%$; range, 34% to 74%).

We calculated two-tailed Mann-Whitney *U* tests to determine if there was a statistically significant difference in the percentage of

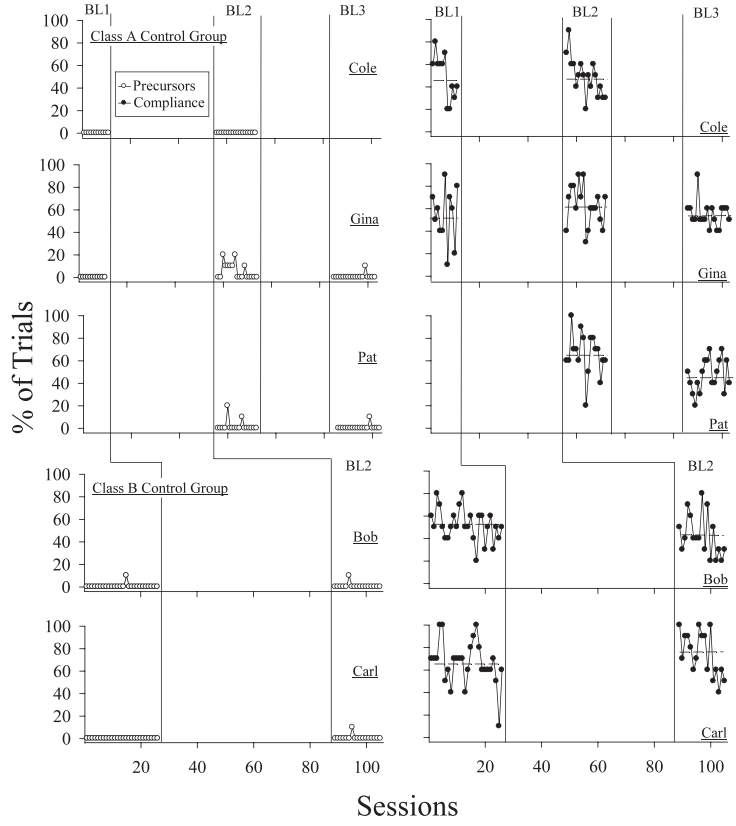

Figure 3. The left column depicts the percentage of precursors (open circles) during Baseline 1 (BL1), Teaching Precursors A, Baseline 2 (BL2), Teaching Precursors B, and Baseline 3 (BL3) for children in the control group. The right column depicts the percentage of compliance (filled circles) across conditions for children in the control group. The third child in Classroom B is not depicted because he terminated enrollment at the preschool. The dashed horizontal line denotes the mean percentage of compliance per condition.

precursors and compliance between the groups before treatment. We used each child's median percentage of precursors and compliance in Baseline 1 for this analysis. There was no statistically significant difference in the performance between the groups before treatment with respect to precursors or compliance, $U = 12$, $p > .05$ and $U = 11$, $p > .05$, respectively. We also calculated a second set of two-tailed Mann-Whitney U tests to determine if there was a statistically significant difference in the percentage of precursors and compliance between groups after treatment. After treatment, there was a statistically significant difference in the percentage of precursors and compliance between the two groups, $U = 0$, $p < .05$, and $U = 5$, $p < .05$, respectively. Thus, the improvements in compliance appeared to be a function of teaching precursors and not a function of other factors associated with time.

Why was compliance maintained as precursors decreased in the return to baseline? Results of a post hoc analysis conducted with the Classroom A experimental group are depicted in Figure 5 (no videotaped sessions were available for children in Classroom B to conduct a similar analysis). This analysis includes data with respect to full precursors, partial precursors (e.g., stopping, looking, saying "yes," or waiting, or any combination of the four

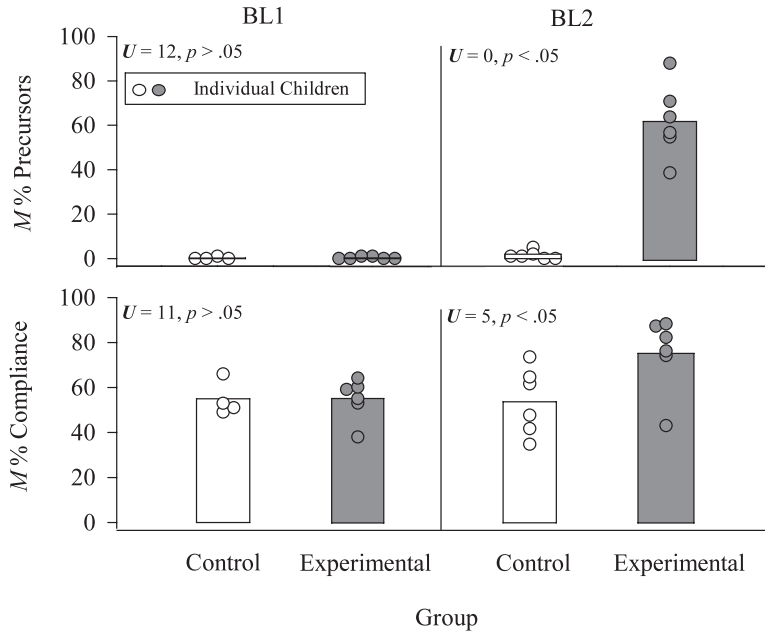

Figure 4. The top panel depicts the mean percentage of precursors for each child in the control and experimental groups (white and gray circles, respectively) and the group mean percentage of precursors for control and experimental groups (white and gray bars, respectively) during Baselines 1 and 2. The bottom panel depicts the individual and group mean percentages of compliance across the control and the experimental groups during Baselines 1 and 2. Mann-Whitney *U* scores derived from comparing the control and the experimental group performances are also depicted.

behaviors) and no precursors. The top panel depicts the percentage of trials with either a partial precursor or precursor that was followed by compliance, the middle panel depicts the percentage of trials with a partial precursor that was followed by compliance, and the bottom panel depicts the percentage of trials with no partial precursor or no precursor that was followed by compliance. The denominator of each data point is the number of trials with a precursor and partial precursor (top), the number of trials with a partial precursor (middle), and the number of trials with no precursor or no partial precursor (bottom). In other words, the denominator is not the total number of trials, but is instead the number of trials with a particular child response. The numerator is the number of trials with compliance following a precursor or partial precursor (top), the number of trials with compliance following a partial precursor (middle), and the number of trials with compliance following no precursor or no partial precursor (bottom). In other words, the numerator includes only compliance that was observed after a particular response. For example, during a 10-trial session, if a partial precursor occurred during five trials and was followed by compliance on four of those trials, the percentage depicted in the second panel was 80%. It appears that compliance is high in the initial baseline (bottom panel); however, as mentioned above, all of the data use *compliance given a particular response to a child's name* as the numerator, and the denominator is *the trials with a particular response to a name call*. These data allow us to determine, of the particular responses to a name call (precursor, partial precursor, or no precursor), how likely a child was to engage in compliance after the particular response. Compliance occurred at moderate and variable levels during the initial baseline,

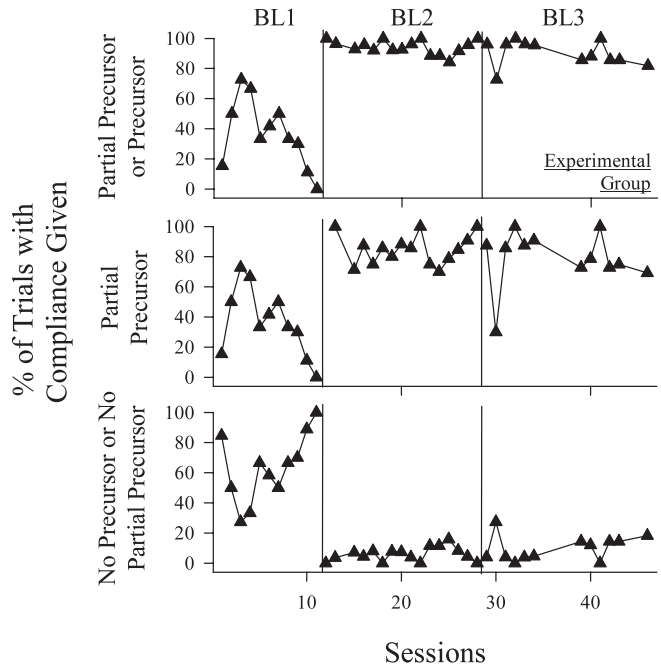

Figure 5. The top panel depicts the percentage of trials with precursors or partial precursors that were followed by compliance. The middle panel depicts the percentage of trials with partial precursors that were followed by compliance. The bottom panel depicts the percentage of trials with no precursors or no partial precursors that were followed by compliance. These data were collected via videotaped baseline sessions of the experimental group in Classroom A.

and the data in the bottom panel show that, when children did comply during the initial baseline (before teaching took place), they were less likely to engage in precursors before compliance. After teaching, compliance was more likely to occur when part of a precursor or a precursor occurred following a name call. These data suggest that compliance may have persisted in the absence of precursor behavior (as originally defined) because participants engaged in parts of the overall precursor, and it seems that engaging in some aspect of the precursor was functionally related to compliance. Figure 5 does not allow us to conclude which, if any, of the behaviors of a partial precursor may have been more or less essential for compliance to occur. These data do reveal that a precursor was indicative of compliance compared to an ignore response, because compliance was markedly greater when an instruction was preceded by a precursor. These data are also consistent with those observed during the descriptive assessment of Study 1.

Was any specific combination or amount of the precursor parts associated with compliance? We analyzed the data with respect to the percentage of trials in which each partial precursor or combination was followed by compliance and noncompliance for children in Classroom A during all baselines to determine if a specific combination or amount of the precursor parts was associated with compliance. It did not appear that any specific partial precursor was associated with substantially higher levels of compliance (e.g., stopping and saying "yes" vs. stopping and looking; data available from the first author). In general, the analysis suggested that the more parts of the precursor emitted (i.e., the closer the response was to the entire precursor), the more likely compliance would

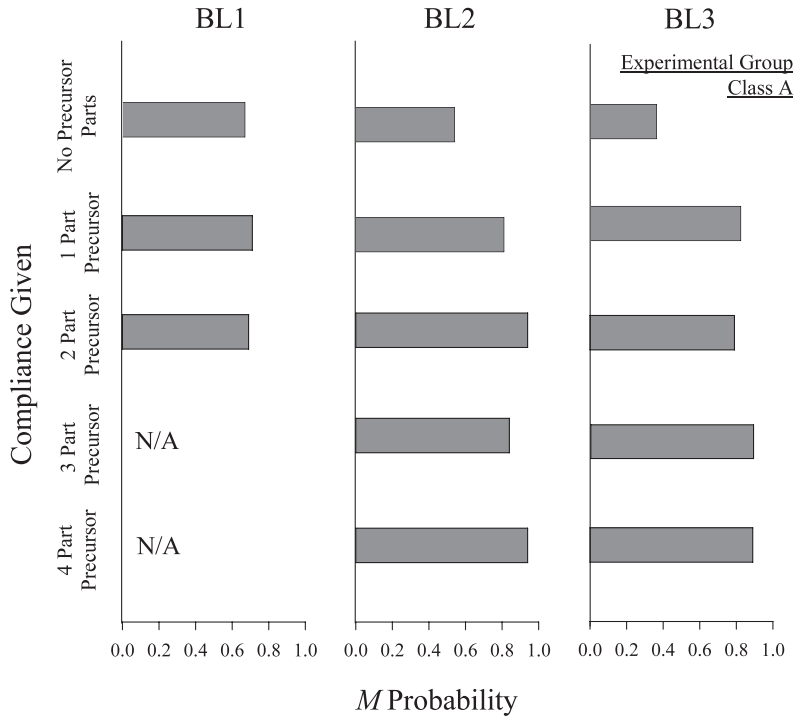

Figure 6. The average probability compliance occurred given no precursor parts, one-part precursors (stop, look, and "yes" that occurred in isolation), two-part precursors (all stop and look, stop and "yes," or look and "yes"), three-part precursors (all stop, look, and "yes," or stop, look, and wait), and four-part precursors (all stop, look, "yes," and wait) during Baselines 1, 2, and 3 for the experimental group in Classroom A. N/A = not applicable (no child engaged in a three- or four-part precursor during Baseline 1).

occur. Therefore, we then assessed whether the amount of precursor parts was associated with compliance and combined the precursor parts into five groups: no precursor, one-part precursors (i.e., all stop, look, and "yes" that occurred in isolation; wait was not included because wait includes both stop and look), two-part precursors (i.e., all stop and look, stop and "yes," and look and "yes"), three-part precursors (i.e., all stop, look, and "yes"; and stop, look, and wait), and four-part precursors (i.e., all stop, look, "yes," and wait) followed by compliance. These data are depicted in Figure 6 and suggest that no particular number of precursor parts (1, 2, 3, or 4 parts) was more or less predictive of compliance. These data do not support the hypothesis that the four-part precursor was essential to improve compliance; instead, these data suggest that, after the children were taught to engage in precursors, if they engaged in some combination of the precursor, they were more likely to comply than if they engaged in no parts of the precursor.

Contrary to the effects observed with the majority of children who experienced treatment, why did Lisa's and Joe's compliance decrease when teaching procedures were removed? Figure 7 depicts the percentage of trials with a full or partial precursor and compliance across each session for the experimental group in Classroom A. We found that as levels of full and partial precursors persisted for John and Earl, similar compliance patterns occurred for these children. By contrast, Lisa engaged in a much lower level of full and partial precursors, and the data path for full and partial precursors

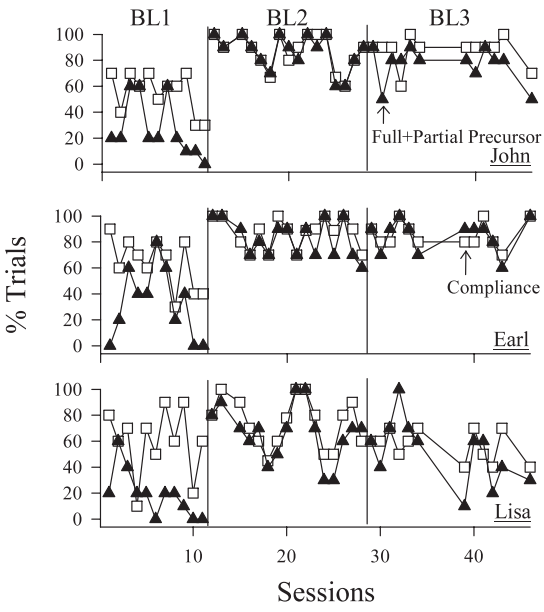

Figure 7. The percentage of trials with full and partial precursors (filled triangles) and compliance (open squares) during Baselines 1, 2, and 3 for the experimental group in Classroom A.

closely followed the pattern of her compliance. We hypothesize that the lower level of full and partial precursors resulted in her relatively lower levels of compliance. We suspect a similar relation existed with Joe; however, we were unable to conduct the same analysis because we were unable to videotape his group. These results underscore the importance of procedures for maintaining at least some parts of the precursor response with children at risk for noncompliance.

What did important stakeholders think about the goals, procedures, and effects? Table 4 depicts the means and ranges of the social acceptability assessment. The respondents agreed, usually strongly, that (a) following directions is a valuable skill, (b) teaching following directions will improve school success, (c) paying attention to one's name is a valuable skill, and (d) teaching children to attend to their names will improve school success. Respondents were more satisfied with the way the children paid attention to their names and with the children's compliance after teaching. The respondents also reported that the tactics were acceptable for a school setting and they would recommend the procedures to others. In addition, both classroom teachers requested assistance with learning to apply the procedures in their classrooms.

GENERAL DISCUSSION

In sum, five important conclusions can be drawn from Studies 1 and 2. First, in Study 1, we found that children were more likely to comply if they responded in some manner following a name call. Second, in Study 2, we demonstrated that teaching children to respond to their names and a group call improved their compliance with individual and group instructions. Third, we taught precursors using readily available classroom activity materials and teacher attention in combination with instructions, modeling, role-play, and feedback. The use of readily available classroom reinforcers might increase the acceptability with teachers who are opposed to edible or token reinforcement. Fourth, the lack of improvement by children in the control group supports the hypothesis that compliance is not likely to improve without programmed intervention. In other words, our data indicate that teachers should not "wait out" noncompliance, but instead should implement procedures that promote compliance. Fifth, we demonstrated that the targeted behaviors were viewed as valuable, the procedures were viewed as acceptable and easy to implement, and the effects were detectable by and satisfactory to various stakeholders.

The results of Study 1 were generally consistent with those of Study 2. In Study 1, compliance was more likely to occur if the children responded in some manner following the name call (a range of 82% to 88% compliance when a child either stopped, looked, or stopped and looked) compared to an ignore response (65% compliance). In Study 2, we observed improvements in compliance when children were taught to respond to their names and a group call. In addition, the

conditional probabilities that we calculated in Study 2 are consistent with those observed in Study 1, in that compliance was less likely to occur following an ignore response (see Figure 4, bottom,and Figure 5). Results of Studies 1 and 2 also suggest that the amount of precursor parts (stop, look, say "yes," and wait) is not indicative of compliance; instead, compliance is more likely if some parts follow a name and group call compared to an ignore response (see Figure 1, bottom, and Figure 5). Our findings also are consistent with those of Stephenson and Hanley (2010), who showed that eye contact and activity interruption had the strongest impact on compliance relative to other antecedent variables (e.g., a teacher being close to and on a child's level prior to delivering an instruction).

We observed a decrease in levels of precursors and maintenance of compliance for four of the six participants after we removed the teaching package. This is interesting, because this finding suggests that precursors were more sensitive to the independent variable than compliance was. However, results of the post hoc analyses (Figures 5, 6, and 7) suggest that compliance may have been maintained because parts of the precursors continued to occur. In other words, the post hoc analyses suggest that the children may have continued to comply because they continued to respond in some manner to the name or a group call. Although they also responded in some manner to the name call before teaching, responding with a partial or full precursor was much higher in the baseline that occurred after teaching. These results replicate those of Kraus et al. (2012), Hamlet, Axlerod, and Kuerschner (1984), and Everett, Olmi, Edwards, and Tingstrom (2005), who all showed that obtaining some child responding to the instructor yields better compliance. The results of these studies were extended by the present analysis because we evaluated the procedure with a group call and compliance with group instructions, because our particular teaching procedures were socially validated, and because the longer term effects of the procedures were evaluated after the teaching procedures had been removed.

We did not experimentally evaluate the causal mechanism behind the increase in compliance. Therefore, our hypotheses regarding why compliance increased after precursors were strengthened are tentative. Increases are probably related to strengthening a component of a composite skill. Johnson and Layng (1992) posited that complex behaviors, called *composite skills,* are made up of component skills. Teaching a precursor might be one link, or component skill, in a complex chain of behavior associated with compliance. By strengthening the initial component skills (i.e., precursors), the subsequent component skills (i.e., compliance) might be more likely to occur.

By contrast, response generalization may adequately describe the increase in compliance (Neef, Shafer, Egel, Cataldo, & Parrish, 1983). Compliance and precursors might be members of a higher order response class. Neef et al. (1983) demonstrated an increase in compliance with novel "do" instructions when one "do" exemplar was taught. They then observed an increase in compliance with novel "don't" instructions when one "don't" exemplar was taught. We classified precursors and compliance as distinct responses, but perhaps a precursor is in the same response class as compliance. By developing a type of compliance with instructions to engage in a precursor, we may have generated improvements in targeted compliance with other instructions in the same response class.

It is likely that several behavioral processes were involved with the effects in our study because our teaching package included multiple components. The intermittent rewards may have increased precursors because the delivery of an instruction or reward was unpredictable, and a name call might have become a discriminative stimulus that signaled the availability of a reward. The increase in precursors

after the introduction of the second teaching precursors condition suggests that feedback and role-play were sufficient; however, we do not know if feedback and role-play would be sufficient without a history with the entire package, and it is unclear to what extent feedback or role-play was essential because we implemented them concurrently.

This study has several limitations. First, full precursors were not maintained across children following the removal of treatment. Future research should evaluate ways to maintain the entire precursor response. Throughout the course of the study, participants occasionally reminded each other of the precursors (e.g., participants said "The teacher is calling you" or tapped each other and pointed to the teacher), and the child reminded would often engage in the full precursor. Perhaps peer-mediated reminders could be evaluated as a means to maintain precursors. Peer mediation might be advantageous because it removes some responsibility from a teacher who is managing a classroom of children (e.g., Flood, Wilder, Flood, & Masuda, 2002; Sainato, Goldstein, & Strain, 1992). Second, all instructions were one-step instructions; therefore, we cannot determine the utility of strengthening precursors for improving compliance with more complex instructions. Future research should evaluate the effects of precursors on compliance with multistep instructions. Third, we did not assess generalization of the effects of teaching to new contexts. Although we did not assess generalization, we included the following tactics described by Stokes and Baer (1977) to increase the likelihood the effects would generalize: (a) We selected behaviors that potentially would be reinforced within natural contingencies, which was supported by our respondents agreeing that precursors and compliance would be appreciated in the school setting; (b) we taught multiple exemplars by teaching the precursors to the individual children's names and to the stimulus "everyone," which might increase the likelihood of the children responding to similar stimuli provided in a different setting; (c) we used indiscriminable contingencies by delivering intermittent rewards, thus potentially increasing resistance to extinction; (d) we programmed common stimuli by teaching across three activity categories, by teaching during a variety of activities within categories, and by including activities similar to those experienced in the children's classrooms.

Some may consider the fact that we did not conduct a functional analysis of the children's noncompliance prior to treatment to be a limitation. The purpose of an analysis is to enable a practitioner to gather information regarding the variables that occasion and maintain a given behavior as well as to collect data to establish a baseline that can be used to detect the effects of treatment. Although we did not conduct a traditional functional analysis, we did conduct an analysis of factors that influenced noncompliance through direct observation and systematic manipulation of the environment; by so doing, we were able to establish a baseline of noncompliance to detect the effects of our treatment. In addition, our activity conformed to the response-to-intervention (RTI) model by use of an assessment that typically would precede an idiographic type of assessment, such as a functional analysis (see the National Center on Response to Intervention, 2010, for a detailed description of the model). RTI is a prevention, assessment, and intervention model that enables a practitioner to streamline the application of behavioral technology into a school curriculum by teaching teachers to provide efficient and high-quality instruction while children who continue to exhibit deficits can be identified. RTI consists of three levels of teaching. The first level consists of high-quality evidence-based instruction that will meet the needs of most children in a classroom. The children who continue to exhibit behavior problems progress to the second level, which involves evidenced-based intervention of moderate intensity in small groups. If a child continues to exhibit behavior

problems, the child then progresses to the third level, which involves evidence-based individualized assessment and instruction. We began at Level 2 to determine if precursors could improve compliance, which could be detected more easily with children who exhibited low levels of compliance. The two children (Lisa and Joe) who did not acquire the precursors at the same time as their peers progressed to the third level, which consisted of individualized instruction immediately before the session. Due to the acquisition of precursors by both children, we did not conduct further individualized assessment.

The need for practical tactics to improve compliance is evident (NICHD, 2003; Rimm-Kaufman et al., 2000; Vandell et al., 2010). Study 1 suggests that name calls are prevalent in a classroom setting and frequently occur before teachers issue instructions. Strengthening precursors, behaviors that follow name calls and precede compliance, is a simple, acceptable, and effective way to improve compliance with children in preschool classrooms.

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