

EFFECTS OF PEER MEDIATION ON PRESCHOOLERS' COMPLIANCE
AND COMPLIANCE PRECURSORS

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We used a multiple baseline design across participants to evaluate the effects of teaching 4 typically developing preschoolers to attend to their names and to a group call (referred to as *precursors*) on their compliance with typical classroom instructions. We then measured the extent to which the effects on both precursors and compliance were maintained when the teaching procedures were removed. Levels of compliance eventually decreased for all children. A multiple baseline design across participants was then used to evaluate the effects of peer mediation on the maintenance of precursors and compliance. Peer mediation involved teaching the children to either remind one another to engage in a precursor or praise one another for engaging in a precursor. Compliance improved with all children as a function of teaching precursors, and these changes were maintained through the use of peer mediation.

Key words: compliance, maintenance, noncompliance, peer mediation, precursors

Teachers report that *compliance*, defined as completing an instruction within a determined time period (Forehand, 1977), is a critical skill for children to master (Lin, Lawrence, & Gorrell, 2003). However, many children struggle with this skill (Rimm-Kaufman, Pianta, & Cox, 2000), and noncompliance continues to be one of the most frequent reasons for psychiatric and psychological referrals (Bernal, Klinnert, & Schultz, 1980; Forehand & Weirson, 1993; Wilens et al., 2002). Although many empirically validated tactics improve compliance (Houlihan, Sloane, Jones, & Patten, 1992), teachers may have difficulty implementing these strategies in addition to the range of other tasks they must do in a typical class day. Currently, few low-effort tactics are available to promote compliance with individuals and groups of children despite the fact that group instructions increase significantly from preschool to first grade (Atwater & Morris, 1988). Therefore, identifying simple,

effective, and acceptable tactics to promote compliance with individual and group instructions may be a useful area of enquiry.

In addition to improving efficiency, the development of simple skill-based tactics may remediate the potential side effects (e.g., problem behavior) that have been associated with some consequence-based interventions such as escape extinction (Wilder, Saulnier, Beavers, & Zonneveld, 2008). We contrast skill-based antecedent tactics with avoidance-based antecedent tactics. Skill-based tactics involve teaching children to engage in a skill that results in an improvement in compliance with the original instruction. Avoidance-based tactics involve altering the delivery of the instruction and improving compliance with modified instructions. Examples of avoidance-based antecedent tactics include nondirective prompting, which involves modifying the instruction into a suggestion (e.g., changing the instruction, "Sweep the floor" to the instruction, "I like it when the floor is clean"; Piazza, Contrucci, Hanley, & Fisher, 1997), and curricular revision, which involves modifying the context or delivery of instruction (e.g., duration, difficulty level, type, order, or choice of tasks) as a way to decrease problem behavior and increase task acquisition

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(Dunlap & Kern, 1996). Using avoidance-based tactics is often an appropriate first step in addressing noncompliance; however, its ultimate success hinges on the reintroduction of the original task and continuation of gains in compliance with that original task. Unfortunately, continuation of the modified task is the norm in this literature.

The main concern with avoidance-based tactics is that the child is never taught the requisite skills to be successful with the original dimensions of the instruction, which the child will likely encounter in his or her future (e.g., engaging in nonpreferred tasks, long tasks, constant vs. varied tasks). In addition, many of the studies in the avoidance-based tactic literature report task engagement measures rather than compliance measures. *Task engagement* refers to the length of time a child works on one particular task; however, an increase in task engagement does not necessarily mean an increase in compliance per se. An advantage of skill-based antecedent tactics is that teachers and practitioners do not have to grapple with the gradual reintroduction of the target demands because these tactics do not involve modification of the original instructions. In addition, teaching skill-based antecedent tactics increases the overall reinforcement in a classroom, which may reduce the likelihood of escape-maintained problem behavior (see Carbone, Morgenstern, Zecchin-Tirri, & Kolberg, 2007, for a review).

Teaching children to respond to a call of their names and to a call of their group is a simple skill-based antecedent tactic that has been shown to improve compliance and has been reported as acceptable by various stakeholders, including teachers (Beaulieu, Hanley, & Roberson, 2012; Hanley, Heal, Tiger, & Ingvarsson, 2007; Kraus, Hanley, Cesana, Eisenburg, & Jarvie, 2012). Kraus et al. (2012) evaluated the effects of teaching precursors (i.e., stopping the activity, orienting towards the teacher, looking at the teacher, and saying "yes" within 3 s of a name call) on compliance with individual instructions

with two typically developing preschoolers. The treatment involved the delivery of tokens contingent on precursors, and the consequences for compliance and noncompliance were the same across the entire evaluation. The authors observed increases in compliance following the teaching of precursors, which supports that teaching children to engage in precursors following a call of their names improves compliance.

Beaulieu et al. (2012) addressed the limitations of Kraus et al. (2012) in a study that involved teaching precursors to six typically developing preschoolers and measuring the effects of teaching precursors on children's compliance with classroom instructions. To address the limitations of previous work, the authors (a) implemented an extended maintenance condition to determine the extent to which precursors and compliance were maintained absent programmed reinforcement and prompting of precursors, (b) controlled for the potential effects of the presence of the tokens in Kraus et al. by including putative reinforcers noncontingently during baseline and contingently during teaching, (c) taught the children to engage in precursors following their name call and a group call, and (d) included a matched control group to determine the extent to which compliance would increase without treatment. Beaulieu et al. found that compliance improved for all children as a function of explicitly teaching them to engage in precursors following an individual or group call, but new questions emerged. Although compliance persisted for most children during an extended maintenance condition of over 3 weeks, precursors diminished over time for all children.

Beaulieu et al. (2012) also noted that the participating children were occasionally observed praising each other for engaging in precursors or prompting each other to engage in precursors, and children were often observed to engage in the precursor when prompted by other children. These observations occasioned the idea of explicitly teaching children to praise or prompt their peers to engage in the precursor following an

individual or group call. The maintenance of precursors through peer mediation may be advantageous because peers could provide prompts and praise during periods in which a teacher is unable to provide prompting or reinforcement due to other classroom responsibilities. Researchers have shown that peer-mediated contingencies can be used effectively to improve children's academic achievement (Greenwood et al., 1984) and social interactions with peers (Sainato, Goldstein, & Strain, 1992) and to decrease off-task behavior (Flood, Wilder, Flood, & Masuda, 2002).

The purpose of this study was to evaluate the use of peer mediation to improve the maintenance of precursors. First, we replicated Beaulieu et al. (2012) by evaluating the effects of teaching children to engage in precursors following an individual and group call on their compliance and by determining the extent to which effects maintained in the absence of treatment. Second, we extended Beaulieu et al. by evaluating the use of peer mediation to maintain precursors during periods without teacher-mediated programming for precursors. Third, we evaluated the extent to which all child responses would be maintained when procedures supporting peer mediation were only intermittently available. Finally, we conducted a social validity assessment of the goals, procedures, and outcomes of this study with classroom teachers.

METHOD

Participants and Setting

Participants included four typically developing preschoolers from the same classroom in a community-based preschool. The children had participated in previous research in teaching precursors (i.e., Beaulieu et al., 2012) during the previous school year in a different classroom, but either displayed issues with maintenance of precursors (Lisa, John, and Ken) or were part of the control group and had no experience with the teaching procedures (Bob). The children

were all 5 years old and were reported to understand one-step instructions. Teachers selected these children as the least likely to comply in their classroom. The classroom staff did not participate but were present throughout the study. All sessions were conducted in a small-group format (two participants and the first author) in a corner of the children's classroom. The dyads included the same children across the entire study.

Response Definitions and Measurement

Observers collected data on precursors and compliance with paper and pencil. We defined *precursors* as a child stopping his or her current activity, looking at the experimenter, saying "yes," and waiting for a response from the experimenter who called his or her name (Beaulieu et al., 2012). *Compliance* was defined as a child completing the instruction delivered by the experimenter within 6 s of the instruction. *Peer mediation (praise)* was defined as a child independently providing a praise statement or brief hand jive (e.g., high-five, fist-bump) to a peer who engaged in a correct precursor within 6 s following the cessation of the experimenter's interaction with the peer. *Peer mediation (reminder)* was defined as a child independently providing a reminder to a peer to engage in a precursor within 3 s of an incorrect or absent precursor. Reminders included both vocal statements (e.g., "Hey Lisa, the teacher [experimenter] just called your name") and gestures (e.g., tapping the peer on the arm and then motioning towards the experimenter with his or her hand).

Session format was identical to Beaulieu et al. (2012). Across the study, session duration was approximately 20 min, but varied because data collection was trial based (each session contained 10 to 15 trials per child, and the range of session duration was approximately 15 to 25 min). Trials varied across conditions, but all trials began with the call of a child's name or a group call (see further description below). We conducted two to three sessions per day 3 to 5 days per week,

depending on child attendance. Sessions conducted on the same day were run consecutively with approximately a 30-s break to obtain data sheets (e.g., immediately after the art activity, the transition/clean-up activity session began, and immediately after the transition, the building activity began so as to simulate a typical classroom schedule). All activities were child directed (the experimenter presented the materials and modeled appropriate play, but children were allowed to engage with the materials in any appropriate manner). If a child engaged in aggression or disruption, he or she was required to sit away from the activity for approximately 30 s (this occurred rarely).

Interobserver Agreement

We collected interobserver agreement data during 46% of all sessions with at least 20% collected in each condition. Data were collected on the occurrence and nonoccurrence of precursors, compliance with individual instructions, and compliance with group instructions. We calculated trial-by-trial agreement and recorded an agreement when two observers scored the same trial in the same way. We then divided the total number of agreements by the total number of agreements plus disagreements and converted the result to a percentage. Mean agreement for precursors following individual name calls was 98% (range, 70% to 100%), precursors following group calls was 96% (range, 76% to 100%), compliance with individual instructions was 98% (range, 80% to 100%), compliance with group instructions was 96% (range, 80% to 100%), peer mediation following individual name calls was 99% (range, 80% to 100%), and peer mediation following group calls was 99% (range, 75% to 100%).

Design

A multiple baseline design across dyads allowed us to evaluate the effects of our teaching packages on precursors and peer mediation, in addition to observing the effects of teaching

precursors and peer mediation on child compliance.

Baseline

Procedures were identical to those in Beaulieu *et al.* (2012). Each child experienced 10 trials (five individual name call trials and five group call trials) that were interspersed throughout the session. The experimenter initiated trials when at least 30 s had passed from the last trial and alternated between individual and group trials throughout the session. During the five individual name call trials, the experimenter called the child's name, waited up to 6 s, and delivered a one-step instruction (if the child engaged in a precursor, the instruction was delivered immediately). All instructions were derived from instructional categories and relied on invariant frames that were based on instructions typically delivered in preschools (see Stephenson & Hanley, 2010). The group instructions required the children to engage in mostly self-help ("Put the play dough in the container," "Put the top on the play dough container," "Wipe your hands with the napkin," "Wipe the table with the napkin") or gross motor ("Sit down," "Push in your chairs," "Hand me the —," "Take a purple marker," "Draw a triangle") tasks. During the five group call trials, the experimenter called the word "everyone," waited up to 6 s, and delivered an instruction. The experimenter delivered descriptive praise following correct precursors, peer mediation, and compliance and ignored all incorrect or absent precursors, peer mediation, and noncompliance (i.e., the experimenter continued with the trial, and no programmed consequence was delivered). A trial ended when the child received praise for a correct response or 9 s had elapsed, whichever came first. At least 30 s elapsed between trials with the same child.

Throughout each session, the experimenter intermittently delivered five noncontingent social or tangible rewards to each child to serve as a control for the presence of the response-dependent rewards delivered during teaching. The rewards

were not contingent on any particular response and did not immediately precede (within 10 s) or immediately follow (within 10 s) a trial. Rewards included 5 s of individualized attention (e.g., praise or hand jives) or complementary material for the activity (e.g., neon markers for an art project, toy cars or people figurines for a house-building project).

Teaching Precursors (without Instructional Demands)

Procedures were identical to those in Beaulieu et al. (2012). We introduced a multicomponent teaching package that included instructions, modeling, role-play, feedback, and intermittent contingent rewards to teach precursors. Because the purpose of this condition was to teach precursors, no instructional demands were delivered following the name or group call (i.e., compliance could not be measured).

Immediately prior to each session, the experimenter led a pre-session role-play. During the role-play, the experimenter instructed the group, after a name call, to stop their activity, to look at the experimenter, to say "yes," and to wait for the experimenter to reply. The experimenter then called each child's name and allowed each child to practice the precursors. Descriptive praise was delivered for correct precursors. After an incorrect precursor, the experimenter delivered descriptive feedback and allowed the child to practice the skill once more. The experimenter then instructed the group to respond to the vocal "everyone" and provided practice in the same manner. The session began immediately after this role-play.

Each child experienced 15 trials per session. Five trials were initiated by the experimenter calling the child's name, and five trials were initiated by the experimenter calling "everyone." Correct precursors were followed by descriptive praise. The remaining five trials were initiated by either the child's name (three trials) or "everyone" (two trials), and correct precursors were followed by a reward (the noncontingent rewards delivered in baseline were no longer delivered). The reward

trials were interspersed throughout the session. We provided rewards during a portion of the trials to decrease the likelihood that a name or group call would become predictive of an instruction delivery and potentially become an aversive stimulus (when instructions were reintroduced). Reward trials were not signaled.

Throughout each teaching session, if the child did not engage in a correct precursor following 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 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 child who did not engage in a correct precursor. During the teaching of precursors, the experimenter praised all peer mediation. Failure to engage in peer mediation resulted in no programmed consequences.

Teaching Precursors (with Instructional Demands)

Procedures were identical to those in Beaulieu et al. (2012) and were implemented after each child emitted precursors at or above 80% during at least 10 teaching sessions during the previous condition. Procedures remained the same as in the previous teaching condition except that the experimenter issued instructional demands during 10 trials (five trials in which a child's name was called and five trials in which the group was called). The experimenter delivered instructions up to 6 s (sooner if the child engaged in a precursor) after a name or group call. The five reward trials continued during this condition but did not include the delivery of an instruction. Thus, participants had 10 opportunities to comply with an instruction (which was the same as in baseline) and 15 opportunities to engage in precursors and peer mediation during this condition.

Teaching Peer Mediation

We used instructions, modeling, role-play, and feedback to teach peer mediation. The feedback

component included vocal and visual feedback and a reward component. Visual feedback consisted of a monitoring board that contained a predetermined number of boxes drawn on a piece of construction paper that was folded in half. If a child engaged in peer mediation (praise or reminders), the experimenter checked a box on the monitoring board. If all boxes had checkmarks by the end of the session, the child selected a small trinket (e.g., sticker, tiny figurine, bouncy ball) from a treasure box. If all boxes were not marked, the experimenter praised the child for any checkmarks he or she had earned and reminded him or her that more checkmarks could be earned next time (i.e., the child was not allowed to select something from the treasure box). At the beginning of each session, all boxes on the monitoring board were empty (checkmarks from previous sessions did not carry over). For the first session, each child's board contained one box. The number of boxes increased by one for each session in which the child accessed the treasure box. The terminal number of boxes drawn on the monitoring board was five rather than 10 (the number of trials), because we did not want the children to engage in peer mediation every time a child's name was called.

Immediately prior to each session, the experimenter led a pre-session role-play. During the role-play, the experimenter instructed the children to provide praise or hand jives to their peer after correct precursors or to remind each other to engage in a precursor after incorrect or absent precursors. The children were then allowed an opportunity to practice. The experimenter pretended to be a child, and the data collector (who represented a teacher) called her name. The experimenter responded with a correct precursor during one practice opportunity (to allow the child the opportunity to practice praising a peer) and with an incorrect or absent precursor during a second practice opportunity (to allow the child the opportunity to remind her to engage in the precursor). The experimenter provided the children with descriptive feedback regarding their

performance and allowed an additional practice opportunity if a child did not engage in correct peer mediation. The experimenter then instructed the group to peer mediate when she said "everyone" and provided practice in a similar fashion. The session began immediately after the pre-session role-play.

During the session, each child experienced 10 trials as in baseline; five trials were initiated by the experimenter's call of a child's name and five trials were initiated by the experimenter's call of "everyone." If a child engaged in peer mediation (praise), the experimenter immediately delivered descriptive praise and checked a box on the child's monitoring board. If a child did not engage in peer mediation (praise), the experimenter described the situation-specific behavior to the child and vocally prompted the child to engage in peer mediation (praise). If a child did not engage in peer mediation (praise) after a group call, the experimenter first praised and then checked the box on the monitoring board of the child who engaged in peer mediation; she then vocally prompted the child who did not engage in peer mediation (praise) to praise the peer.

If a child engaged in peer mediation (reminder), the experimenter delivered descriptive praise and checked the box on the child's monitoring board after the conclusion of the trial with the child whose name had been called (after the delivery of an instruction and an opportunity to comply was afforded). The praise and checkmark occurred after the trial so as to not disrupt the trial with the child whose name had been called. If a child did not engage in peer mediation (reminder) following a peer's incorrect or absent precursor during an individual or group trial, the experimenter vocally prompted the child to engage in peer mediation (reminder) before the trial was complete. The experimenter delivered praise following prompted peer mediation (praise and reminders), but children did not receive checkmarks on their monitoring boards.

During the teaching of peer mediation, the experimenter did not provide corrective feedback

after incorrect precursors or noncompliance. The experimenter provided corrective feedback only with respect to peer mediation. Consistent with all previous conditions (including baseline), the experimenter continued to deliver praise after correct precursors and compliance.

Baseline Versus Teaching Peer Mediation

We alternated periods with no teaching procedures for peer mediation or precursors (i.e., baseline) with periods that included teaching peer mediation. This alternation phase allowed us to simulate a classroom environment in which teachers were available to provide differential consequences only some of the time. The alternation of baseline contingencies with teaching contingencies allowed us to evaluate the extent to which precursors, compliance, and peer mediation would persist during periods with no programmed teaching for those skills. Procedures for baseline and teaching were identical to those previously described. We initially alternated one baseline session with two teaching sessions. After two rotations of that sequence, we decreased the ratio to 1:1.

Social Validity Assessment

We assessed the importance of the behaviors targeted for change, the acceptability of teaching procedures, and the satisfaction with the children's performance with the participants' lead teacher and her assistant teacher. After answering general questions on a questionnaire (see Table 1, Questions 1 through 4), the teachers viewed a video sample of the children before and after teaching and were then asked to answer questions regarding the children's performance (see Table 1, Questions 5 through 10). The teachers were blind to the condition they were observing, purpose of the study, and teaching procedures. Teachers completed questions regarding one video before viewing the next video and viewed the first 5 min of the first videotaped sessions of Baselines 1 and 3 (Baseline 1 occurred prior to treatment, and Baseline 3 occurred after treatment and

during the final alternation phase). Each video sample included at least three opportunities to assess each skill (three name calls, group calls, and instructions). Last, the teachers viewed a 2-min video of the teaching condition, which depicted each teaching component, and then answered questions regarding the acceptability of the teaching procedures (see Table 1, Questions 11 and 12).

RESULTS

Figure 1 depicts the percentage of trials with precursors across conditions and sessions for all children. Precursors were rarely (Bob, Lisa, and John) or moderately (Ken) observed during baseline. Following precursor teaching, precursors increased to a high level across all children; therefore, the teaching package was effective for strengthening precursors. Figure 2 depicts the percentage of trials with compliance across sessions for all children. Despite no changes to the consequences for compliance or noncompliance, the level of compliance increased and variability decreased across all children after teaching precursors.

After removal of the teaching package for precursors, high levels of precursors initially persisted for all children (see return to baseline on Figure 1); however, precursors quickly became more variable and declined to initial baseline levels across all children. Similar to precursors, compliance initially was maintained for all children (see return to baseline Figure 2), but we observed a decrease in level and an increase in variability across all children. Thus, neither precursors nor compliance persisted over time without the teaching procedures.

Figure 3 depicts the amount of peer mediation across conditions for all children. All peer mediation responses shown are independent child responses (data on prompted peer mediation are available from the first author). Reminders were rarely observed and praise was never observed

Table 1
 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?	7	
2. Do you think that teaching instruction following is likely to increase a child's success in school?	7	
3. Do you think a child attending when their name is called is a valuable skill for children?	6.5 (6–7)	
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 (6–7)	
5. Are you satisfied with the way these children attended to their names?	Baseline 1 video 1.5 (1–2)	Baseline 2 video 6.5 (6–7)
6. Do you think the way these children attended to their names would be appreciated at school?	1.5 (1–2)	6.5 (6–7)
7. Are you satisfied with the way these children followed instructions?	3	7
8. Do you think the way these children followed instructions would be appreciated at school?	3	7
9. Are you satisfied with the way these children helped each other?	1	6.5 (6–7)
10. Do you think the way these children helped each other would be appreciated at school?	1	6.5 (6–7)
11. Do you think these teaching procedures are acceptable for a school setting?	Teaching component video 7	
12. Would you recommend these teaching procedures to others?	6.5 (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*.

during the baseline and teaching precursors conditions. After implementation of the teaching package for peer mediation, we observed an increase in the amount of peer praise across all children. We rarely observed peer reminders during the teaching peer mediation condition; however, precursors occurred at a high level during this condition, providing limited opportunity to engage in peer reminders. Precursors and compliance were observed at the highest levels with the least amount of variability during this condition despite the fact that the consequences for precursors, compliance, and non-compliance remained the same as in baseline (Figure 1 and Figure 2, respectively). Therefore, teaching peer mediation appeared to have a positive impact on the maintenance of precursors and compliance.

During the alternation of baseline and peer mediation teaching, the amount of peer praise was maintained at similar, but slightly lower, levels during baseline than in the teaching condition across all children. Peer reminders occurred at similarly low levels across baseline and teaching conditions. These data show that peer mediation was maintained during periods without teaching procedures in place. Precursors and compliance were maintained at high levels with minimal variability across all children (see Figures 1 and 2).

Table 1 depicts the results of the social validity assessment. The teachers 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, (d) teaching children to attend to their names will improve school success, (e) they

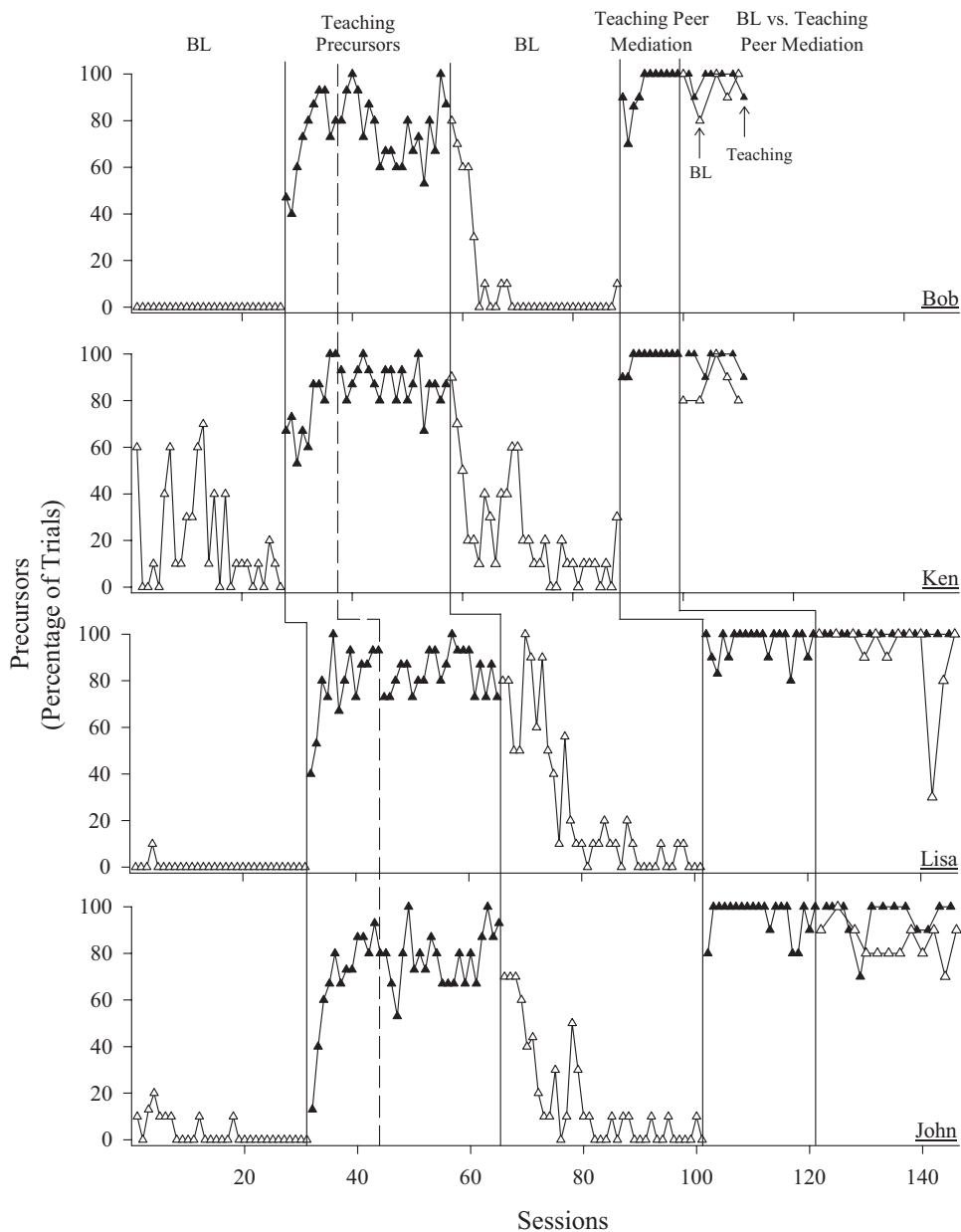


Figure 1. Percentage of trials with precursors across baseline (BL) and teaching conditions for all participants. The dashed line indicates when instructions were introduced during teaching sessions.

were satisfied with the way the children helped each other, and (f) the way the children helped each other would be appreciated at school. Teachers were more satisfied with the way the children attended to their names, the children's

compliance, and peer mediation after teaching. The teachers reported that the teaching was acceptable for a school setting and that they would recommend the teaching procedures to others.

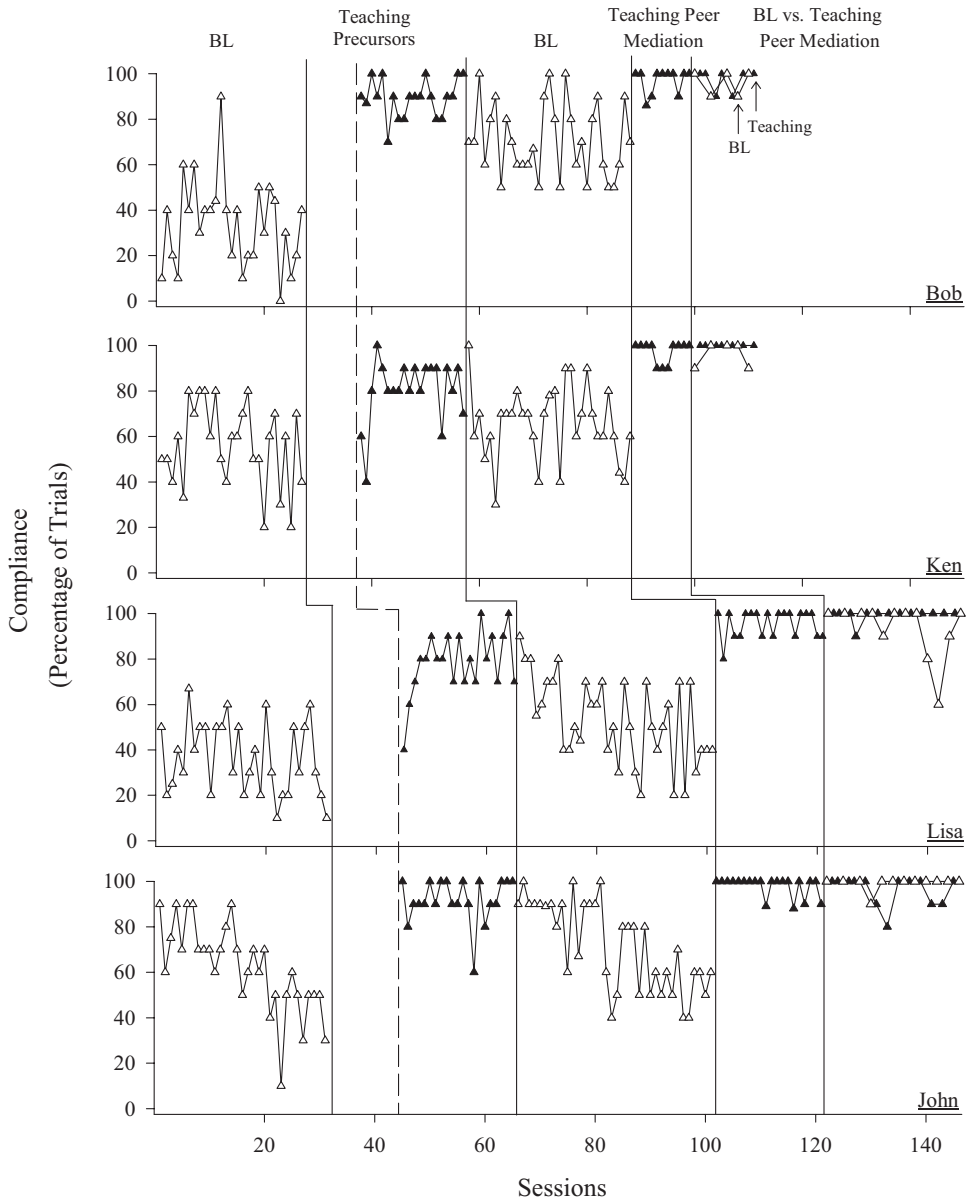


Figure 2. Percentage of trials with compliance across baseline (BL) and teaching conditions for all participants. The dashed line indicates when instructions were introduced during teaching sessions.

DISCUSSION

We demonstrated that (a) teaching children to engage in precursors following a call of their names and their group improved their compliance with individual and group instructions,

(b) teaching children to remind each other to engage in a precursor maintained the improvements in precursors and compliance during periods without any programmed teaching, and (c) precursors, compliance, and

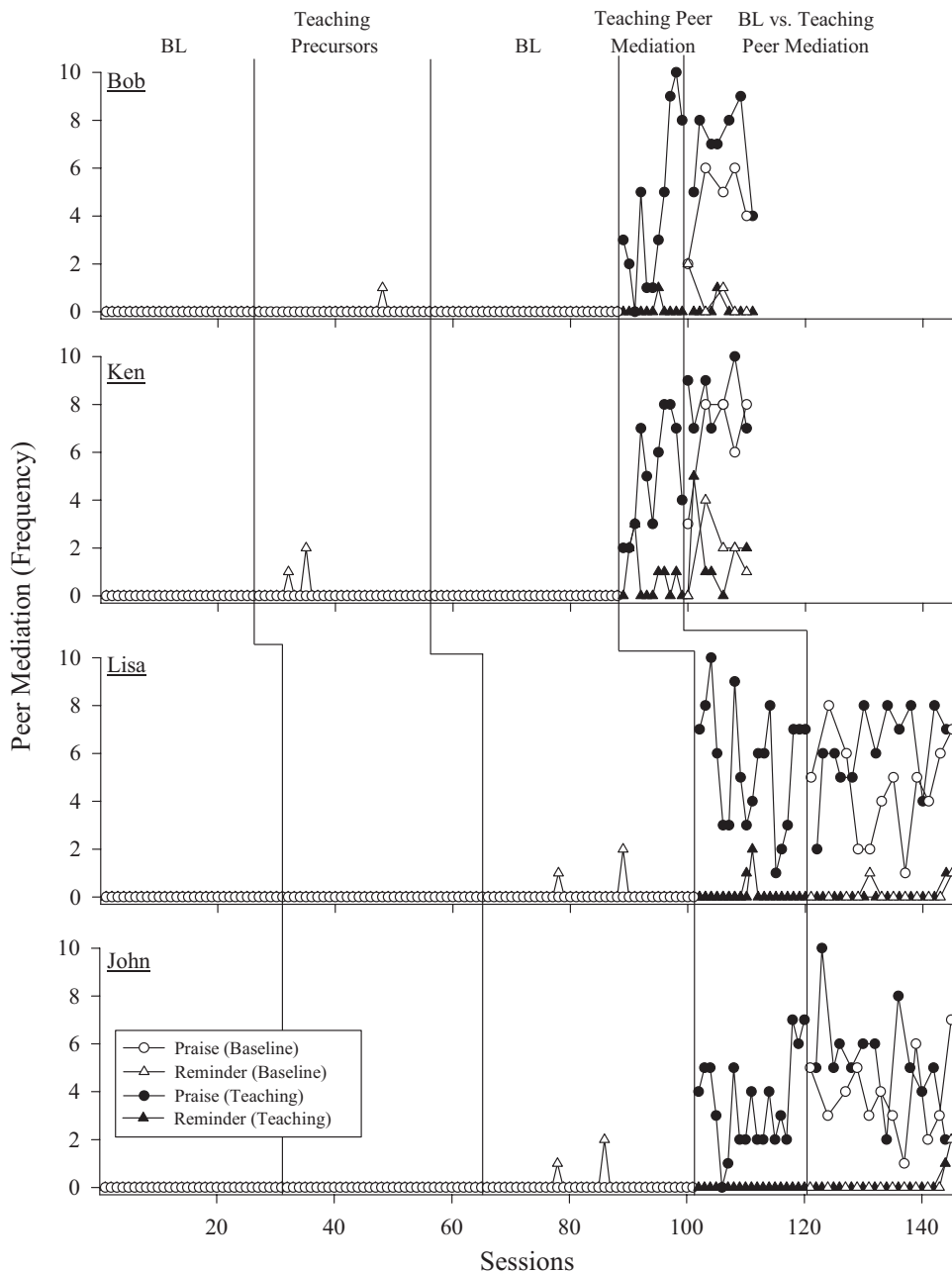


Figure 3. Frequency of peer mediation (praise and reminders) across baseline (BL) and teaching conditions.

peer mediation were viewed as valuable, the teaching procedures were viewed as acceptable, and the effects were noticeable and satisfactory to the participants' classroom teachers. Despite

the reports that our participants were the least compliant children in their classroom, they served as effective peer mediators for the second child in their dyad.

Some of our results appear to be discrepant with those of Beaulieu *et al.* (2012), who observed maintenance of compliance with four of the six participants as precursors decreased. In the current study, we observed a decrease in compliance similar to the initial baseline as the precursors decreased. A post hoc analysis conducted by Beaulieu *et al.* showed that although full precursors decreased (*i.e.*, the complete response of stopping, looking, saying "yes," and waiting was observed less over time), parts of the precursors (stopping, looking, saying "yes," or waiting) were maintained for most children. Beaulieu *et al.* suggested that compliance was maintained because some part of the precursor occurred before compliance. We conducted a similar analysis with the children in this study and observed similar results (data available from the first author). More specifically, we observed that compliance followed a pattern similar to the full and partial precursors, and the only difference between the current study and Beaulieu *et al.* was that the full and partial precursors declined somewhat faster in the current study, as did compliance. The reason for the observed difference is unclear, but it may be a function of a smaller group size. In Beaulieu *et al.*, there were three children per group, and in the current study there were two children per group. The smaller group size resulted in a reduction of peer models, which may have affected the maintenance of precursors. These results suggest that classwide application of these teaching procedures, as in Hanley *et al.* (2007), might mitigate the decrease in precursors over time.

We observed the highest level of precursors and compliance when the contingencies were peer mediated as opposed to teacher mediated. This finding is consistent with prior research showing the strength of peer-mediated interventions (Greenwood *et al.*, 1984). We did not conduct a formal assessment of the reinforcing value of peer versus teacher praise or the potential punishing value of peer versus teacher reminders; however, differential values of these consequences may have contributed to the relative success of our peer-mediated intervention. In addition, we

do not think peer-mediated tactics should take the place of teacher-mediated tactics. Instead, we suggest that peer-mediated tactics should be used in combination with teacher-mediated tactics, as was modeled in the final phase of the analyses. Precursors, compliance, and peer mediation persisted during periods without teacher mediation when alternated with periods in which teachers prompted and reinforced peer mediation. Peers' praising and reminding behavior may have persisted because peer mediation contacted natural social reinforcers provided by the peers who were praised or reminded.

Our analysis has some notable limitations. First, all instructions included a demand for only one behavior; thus, we cannot determine whether teaching precursors and peer mediation would improve compliance with multistep instructions; this should be evaluated in future research. Second, some of our procedures pose limits on the external validity of the findings. We pulled the children aside in their classroom and implemented teaching for approximately 45 min per day during child-led activity periods, with the lead author acting as the teacher to maximize the fidelity of the procedures. Although teachers viewed the procedures as acceptable, we did not directly assess whether they would be willing and able to implement them in their classrooms. Future research should include an evaluation of these tactics by classroom teachers on a classwide level to determine the extent to which they can and will implement the procedures. This arrangement also would allow teachers to select instructions that are particularly problematic for individual children or groups of children. Although we observed low to moderate levels of compliance during baseline and used typical instructions delivered in preschool classrooms, the instructions we used may not have been the same instructions that were of concern to the teachers. Clearly, scaling the intervention to the classwide level would introduce new considerations, such as identifying the best way for teachers to address group instructions with more children and preventing peer reminders (*i.e.*, peer attention)

from functioning as reinforcers for some children's problem behavior. However, it would also help to determine whether consultant-based small-group teaching and monitoring boards are necessary when children experience teaching across the entire day. A third limitation was that we assessed maintenance by alternating sessions with and without teacher-mediated consequences on a 2:1 or 1:1 basis. Therefore, we cannot determine how long precursors, peer mediation, and compliance would persist if a teacher stopped teaching for longer periods of time.

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