Journal of Behavioral Education (2021) 30:226–246
https://doi.org/10.1007/s10864-020-09366-6

ORIGINAL PAPER

A Comparison of Two Group Contingencies on Teachers' Use of Behavior-Specific Praise

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Published online: 27 January 2020

Abstract

The present study evaluated the effects of two reinforcement contingencies on teacher use of behavior-specific praise (BSP) in the classroom. An alternating treatments design was used to compare the implementation of both an independent and interdependent contingency to increase frequency of BSP delivery. Four general education elementary school teachers and their students participated. Teachers' use of BSP and general praise, as well as, behavior-specific and general reprimands were evaluated. Data were also collected on students' levels of academically engaged and disruptive behaviors. Both the independent and interdependent conditions resulted in higher frequencies of BSP and reduced the use of both general and behavior-specific reprimands. Student levels of academic engagement increased while disruption decreased across both contingencies. Results of the present study are discussed in terms of related literature and implications for applied practice.

Keywords Praise · Group contingency · Teacher behavior

Introduction

School personnel are continually searching for ways to improve the educational climate and increase positive student outcomes. Although educators have historically relied on the use of reactive and punitive strategies to manage student behaviors (Acker and O'Leary 1987; Sugai and Horner 2008), studies have shown these techniques are unlikely to result in optimal outcomes. Whereas these strategies may be effective in reducing problematic behaviors, they do little to improve students' prosocial behaviors (Cherne 2008). Alternatively, in recent years, schools have

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begun to transition to the use of more positive behavior management strategies (e.g., Coffey and Horner 2012; Stage and Quiroz 1997)., These positive behavior management systems may be implemented as a means of teaching expectations and appropriate replacement behaviors, resulting in collateral decreases in disruptive behaviors (DB) demonstrated by students (Reinke et al. 2013; Sugai 2008). One of the most cost-effective and time-efficient strategies for teaching replacement behaviors is the use of praise in the classroom (Bear 2013).

Praise, as defined by Simonsen et al. (2008), is "a positive statement, typically provided by the teacher, when a desired behavior occurs to inform students specifically as to what they did well" (p. 362). In other words, praise should be provided following the occurrence of a desired behavior. In order for praise use to be most effective, praise statements should not only be contingent but also behavior specific (Chalk and Bizo 2004). Behavior-specific praise (BSP) is designed to inform the receiver, with some specificity, of the behavior to which a praise statement is tied. In other words, BSP statements show approval by directly stating the behavior involved (e.g., good job getting your book out). Alternatively, general praise statements do not (e.g., good job).

Chalk and Bizo (2004) evaluated the use of BSP versus general praise statements to increase positive classroom behaviors. Those students who received BSP were engaged in higher levels of on-task behaviors in the classroom than those who received general praise (Chalk and Bizo 2004). Similarly, Richard (2012) manipulated the use of general versus BSP statements in an elementary setting. Results indicated higher levels of academically engaged behavior (AEB) when students received BSP rather than general praise from teachers (Richard 2012). Although the use of praise in the educational setting, especially that which is contingent and behavior specific, has been shown to increase desired student behaviors, its use is often inconsistent and infrequent (Jenkins et al. 2015).

Increasing Teachers' Use of Praise

Because studies have shown that naturally occurring rates of praise are low (e.g., Burnett and Mandel 2010; Reinke et al. 2013; White 1975), researchers have sought ways to improve teachers' use of BSP in the classroom setting. Didactic training is one of the most common techniques used in an attempt to increase teachers' use of target strategies. As defined by Sanetti et al. (2018), didactic training refers to the "verbal overview of [an] intervention by [the] consultant within [the] behavioral consultation" relationship (p. 44). Though they are common and require few resources, didactic trainings alone often result in little improvement in performance and infrequent use of new techniques (Cavanaugh 2013; Myers et al. 2011). Given the limited support for didactic training as a means of promoting the use of newly taught skills, researchers have investigated the effects of group contingencies as a means of promoting teacher use of newly taught skills. Group contingencies may be more practical than didactic training alone because they entail the delivery of reinforcement to a variety of participants using the same contingencies, criteria and reinforcers (e.g., Murphy et al. 2007). Several researchers have evaluated the effects

of independent group contingencies, in which reinforcement is provided dependent upon an individual meeting reinforcement criteria (Cooper et al. 2007), on teacher behavior.

DiGennaro et al. (2007) evaluated the degree to which four special education teachers implemented a behavior plan. During baseline, all participants received integrity scores of 0%, indicating that none of the four responded to student problem behaviors according to the student's intervention plan. Researchers found that when teachers were able to avoid meeting with the experimenter contingent on integrity, integrity neared 100% whereas when teachers received performance feedback alone, integrity marginally increased or remained at 0% (DiGennaro et al. 2007). Similarly, Noell, Witt, LaFleur, Mortenson, Ranier and LeVelle (2000) evaluated treatment integrity of five teachers in regard to a peer-tutoring academic intervention. Teachers were trained to 100% integrity following baseline, yet performance quickly diminished upon introduction of the treatment condition. As with DiGennaro and colleagues (2007), researchers saw increased levels of treatment integrity when the opportunity to avoid meeting with the experimenter was in place. These two studies suggest that negative reinforcement was powerful in producing improved teacher implementation of target interventions. Little research, however, has evaluated the effects of positive reinforcement strategies on teacher behavior, let alone increases in use of praise.

Unlike the independent group contingencies utilized by DiGennaro and colleagues (2007) and Noell and colleagues (2000), interdependent group contingencies provide reinforcement to all members of a group contingent upon each member of the group meeting a performance criterion (Cooper et al. 2007). Although interdependent group contingencies are frequently applied to address student behavior (e.g., Good Behavior Game; Barrish et al. 1969; Christ and Christ 2006; Hunt 2012), to our knowledge, only one study has evaluated the effect of an interdependent group contingency on teachers' delivery of praise. In this study, Smith et al. (2013) evaluated the use of an interdependent group contingency in the context of a summer camp for children with disabilities. The study used an A–B–C–B–C withdrawal design consisting of baseline, group contingency alone, group contingency plus performance feedback, the repeat of group contingency alone, followed by the repeat of group contingency plus feedback. During the group contingency phase, participants were told each morning to provide campers with positive feedback, and that the team with the greatest number of praise statements at the end of the week would receive an ice cream trip paid for by the experimenters. The contingency plus feedback phase was more intensive and involved visual feedback in the form of a graph, goal setting for number of praise statements and public posting of goals in the staff office. The winning team during the contingency plus feedback condition was calculated in the same manner as the previous phase. Results of the study demonstrated that both the group contingency and contingency plus feedback phases resulted in increased use of BSP by the group leaders from baseline to intervention.

Purpose of the Present Study

Research has indicated that group contingencies may be effective in changing teacher behavior (e.g., DiGennaro et al. 2007) and may be particularly useful due to the ease of implementation (e.g., Murphy et al. 2007). Although initial support for group contingencies is promising, limited research has evaluated their effect on teacher praise within general education classrooms—particularly for interdependent group contingencies. The current study sought to compare the effects of both an independent and an interdependent group contingency on teacher use of praise. Further, the study was designed to evaluate the collateral impact of each contingency on teacher delivery of reprimands, as well as student AEB and DB.

Method

Participants and Setting

Permission to conduct research in the elementary setting was obtained from the district office where the school was located as well as from the school's principal. The primary researcher, a school psychology doctoral student, also obtained approval from the affiliate university's Institutional Review Board. The current study took place at an urban elementary school in the southeastern USA. The school included 432 students in preschool to 5th grade, with approximately 93% of these students qualifying for either free or reduced lunch. Of the student body, 79.9% of the students identified as African-American, 5.8% as Caucasian and 11.8% as Hispanic. The remaining 2.5% of students identified as either Asian, Native American, Multi-Racial or Pacific Islander. Four general education teachers were recruited as participants for the study. Teacher participants were referred to the primary researcher by the multi-tiered systems of supports (MTSS) coordinator at the school. Each teacher was referred due to high rates of reprimands in the classroom or for help managing student DB.

Ms. Jackson (pseudonym), an African-American female, was a second-year Kindergarten teacher. She had previous experience as a teaching assistant and held a bachelor's degree in Elementary Education. She had 26 students in her classroom, 14 males and 12 females. Twenty-two of her students identified as African-American and four as Hispanic. She had two students in her class with Individualized Education Programs (IEPs).

Mrs. Jones was also a kindergarten teacher. She was an African-American female in her third year of teaching and held a master's degree in Special Education. Her class was made up of 28 students, 13 males and 15 females. Twenty-two of her students identified as African-American, one as Caucasian and five as Hispanic. None of her students held IEPs.

Mrs. Crowley, an African-American female, was a first-grade teacher in her fourth year of teaching. She held a bachelor's degree in Elementary Education and her class was made up of 22 students, 13 males and 9 females. Sixteen of these

students identified as African-American, one as Caucasian and five as Hispanic. None of her students held IEPs.

Mrs. Robinson, a Caucasian female, was also a first-grade teacher. She was in her third year of teaching and held a bachelor's degree in Elementary Education. Her class was made up of 21 students, 8 males and 13 females. Seventeen of her students identified as African-American, two as Caucasian, one as Hispanic and one as Arabic. None of her students held IEPs while the present study took place.

Given the interdependent group contingency to be evaluated, teacher participants were partnered into teams of two based on the grade level they taught. Ms. Jackson and Mrs. Jones, the two kindergarten teachers, acted as the first pair while the first-grade teachers, Mrs. Crowley and Mrs. Robinson, acted as the second. Each pair of participants received the same sequence of intervention conditions and had access to reinforcement as a team during the interdependent treatment condition.

Dependent Variables

Teacher Behavior

The primary dependent variable in the present study was the number of BSP statements issued by a teacher participant within a 20-min period. A BSP statement was defined as a verbal statement issued by the teacher to convey approval that provided the student with a description of the specific behavior being praised. For example, "Johnny, I love how quietly you are sitting in your desk," or "Thank you for completing your math worksheet on time." Although it is common for teachers to use a student's name when delivering a praise statement, it was not required that a BSP statement include the child's name to be coded as occurring.

In addition to the number of BSP statements delivered during observation, data were also collected on the number of general praise statements delivered by teacher participants. A general praise statement was defined as any verbal statement conveying approval that did not specifically label a behavior. An example of a general praise statement would be a simple, "good job." Data on two variations of reprimands were also collected: behavior specific and general. A behavior-specific reprimand was defined as a corrective statement or remark that specifically referenced the behavior to which a reprimand was tied (i.e., "Stop tapping your pencil"). A general reprimand was defined as a corrective statement that did not specifically label a behavior, such as "Sam, stop."

Data on student behaviors were also assessed as part of the current study. The behaviors recorded during observations were classified as either academically engaging or disruptive. AEB was defined as writing on the assigned academic task (e.g., a workbook page), participating in class discussion by raising hand, answering teacher questions aloud as part of a group, asking the teacher or a peer a question pertaining to current academic task or being oriented toward teacher during lecture. DB consisted of the following: inappropriate vocalizations, defined as vocalizations unrelated to the academic activity; playing with objects, defined as manipulation of objects unrelated to the academic task or manipulation of objects in a manner

inconsistent with their intended use; noncompliance, defined as breaking a classroom rule or failing to follow a teacher directive delivered during the same interval; and out of seat, defined as a student's buttocks breaking contact with their assigned seat for three or more seconds without teacher permission.

Social Validity

Following completion of the intervention, teacher participants were asked to complete the Behavior Intervention Rating Scale (BIRS; Elliot and Von Brock Treuting 1991). The BIRS consists of 24 items rated on a 6-point Likert scale. Completion of the BIRS results in three scores: acceptability, effectiveness and time to effectiveness. Psychometric evaluations of the BIRS have indicated good internal consistency, with alphas of 0.97, 0.92 and 0.87 for the acceptability, effectiveness and time to effectiveness factors, respectively. An overall alpha was determined to be 0.97 (Elliot and Von Brock Treuting 1991).

Data Collection

Data for the present study were collected during 20-min periods that each teacher identified as the time when her students were most disruptive. The 20-min observation was further divided into 10-s intervals. Within each 10-s interval, the observer recorded a frequency count of praise statements and reprimands delivered by the teacher participant. Student behavior during each 10-s interval was recorded using momentary time sampling in an individual-fixed method of group observation—a method found to closely approximate duration recording (Briesch et al. 2015; Dart et al. 2016). Using such a procedure, the first student in the first row was observed during the first interval. During the next interval, the second student in the first row was observed. The observation proceeded in this manner until each student in the classroom had been observed, at which point the observation began anew with the first student and continued until the 20-min observation was completed.

Procedures

Screening

An observer conducted one 20-min observation in each referred teacher's classroom to determine whether he or she was eligible to participate in the present study. If a referred teacher issued less than ten BSP statements per observation, she qualified to participate. The first four participants recommended for inclusion in the study met screening criteria. As the observation protocol for screening was identical to that used during baseline and intervention, the screening observation served as each participant's initial baseline point.

Baseline

During the baseline phase of the present study, participants were instructed to continue use of their everyday classroom management procedures. Feedback on frequency of praise and reprimands, as well as levels of student behaviors, was not provided to participants during baseline.

Training

Following baseline, teacher participants were trained on the use of BSP in the classroom. The training was didactic in nature, lasted approximately 30 min and was conducted separately with each pair of participants. Information presented during training included researcher-provided examples and non-examples of each type of praise and reprimand, as well as empirical information regarding the effects of the use of BSP on student outcomes. Teacher participants were not provided with information regarding strategies for recognizing behaviors to be praised, increasing use of general praise or decreasing reprimands. During the training, the researcher explained to participants that two phases of treatment would occur, as well as the reinforcement contingency to be in place during each condition. Teachers were also informed of the reinforcement criteria per condition. During the independent condition, teachers were required to emit at least ten BSP statements per observation. During the interdependent condition, this criterion was doubled to 20 BSP statements issued between a pair of participants. Teachers were considered trained once they were able to provide three examples of BSP and independently recall the criteria for reinforcement in each condition when asked.

Following training in BSP, each teacher participant was asked to name several stimuli she would enjoy receiving. With the approval of the building's principal, school supplies were chosen as viable stimuli. Participants named preferred items such as sticky notes, notepads, dry-erase markers, permanent markers and felt-tipped pens. These items were placed in a clear basket from which teachers could choose contingent upon the behavioral criterion being met.

Independent and Interdependent Treatment Conditions

In an effort to reduce reactivity, the primary researcher was uninvolved with the consultation and performance feedback provided during treatment conditions. A school employee, in this case, the MTSS coordinator, was recruited to act as consultant during intervention. The MTSS coordinator held a Masters of Education with a concentration in Special Education. She was responsible for providing curriculum and academic intervention support to teachers of grades Kindergarten through 5th at the elementary school were the study took place. It is important to note that all participants were accustomed to receiving performance feedback from this individual during weekly grade-level meetings prior to implementation of the present study. The feedback dynamic already in place between the MTSS coordinator and participants allowed for more naturalistic discussion following observations and prevented the primary researcher from serving a dual role as consultant and observer during

intervention. The primary researcher was, however, present to evaluate the integrity with which the intervention was implemented by the MTSS coordinator.

Similar to teacher participants, the MTSS coordinator received didactic training on the use of behavior-specific praise prior to the first intervention session. However, she also received training on performance feedback as a primary component of the present study. During training, the coordinator was provided with written examples and non-examples of proper feedback to teacher participants, observed the primary researcher model proper and improper feedback live with a non-participating teacher at the school, practiced feedback for both delivering and withholding reinforcement contingent on BSP goals and received feedback on her own performance from the primary researcher during training. She was given a script for both delivery and withholding of preferred items for both the independent and interdependent conditions and was required to maintain 95% feedback integrity throughout the intervention phase. All performance feedback and reinforcement delivery/withholding were completed by the MTSS coordinator throughout treatment conditions. At no point did she require retraining.

Prior to each treatment session, teacher participants were informed of the condition in place for the given day. Each teacher was asked to confirm her understanding of the day's condition and repeat whether she had the potential to access reinforcement contingent upon her own behavior or if she would be working with her teammate. During the independent contingency, each teacher participant had the ability to earn reinforcement based on her own frequency of BSP statements per observation. The pair had access to the same reinforcer contingent upon meeting the same criteria; to gain access, however, participants were required to meet the criterion individually. As previously described, the criterion for the independent condition was 10 BSP statements emitted per 20-min observation. After each observation, the researcher tallied the number of BSP statements emitted and determined whether the participant met criteria for reinforcement based on the condition in place. The number of BSP statements emitted was shared with the MTSS coordinator out of earshot prior to providing performance feedback in order for her to deliver or withhold reinforcement. A script was used by the coordinator to ensure consistency in performance feedback procedures. Each treatment contingency had a script tailored to fit the corresponding intervention condition. Script options for both meeting and missing reinforcement criteria were given to the coordinator to use following observation.

During the interdependent condition, teacher participants were required to work in pairs to access reinforcement. Between the two participants, a criterion of 20 BSP statements across both teachers had to be met. Although this criterion had the potential for each teacher to emit the same number of praise statements set as criteria in the independent condition (e.g., 10 each), it also allowed for one participant to out-perform the other. No matter how the statement frequencies were distributed across participants in the pair, reinforcement was delivered if total BSP across teachers in the pair met or exceeded 20. During interdependent condition, teachers were observed separately during 20-min observations. Following observations of each classroom, feedback on frequency of BSP statements was given as a total number of statements for the pair, followed by the individual count for each teacher. While

observations during this phase were conducted individually, feedback during the interdependent condition was delivered to both teachers in a pair at the same time. For pair one, Mrs. Jackson was observed, followed by Mrs. Jones. Feedback was delivered to both immediately following Mrs. Jones' observation. For pair two, Mrs. Crowley was observed first, followed by Mrs. Robinson. Feedback for pair two was delivered immediately following Mrs. Robinson's observation. The inclusion of both teachers in the feedback session for the interdependent condition was essential in allowing participants to distinguish the team versus individual aspects of the interdependent versus independent conditions. As during the independent condition, a script was used for the interdependent condition to ensure that performance feedback and reinforcement was provided in a consistent manner across pairs.

Design and Data Analysis

An alternating treatment design with initial baseline phase was used for the present study. As part of the experimental design, participants experienced a baseline phase, followed by the alternating of two intervention conditions: an independent group contingency and an interdependent group contingency. The contingency in place during each observation was determined randomly prior to the start of the treatment phase. Though the conditions were randomly chosen, if the same treatment was drawn two days in a row, on the third day in the sequence, the alternative treatment was presented by default. Because the ability to discriminate between treatment conditions is paramount to an alternating treatments design, teachers were informed at the beginning of each observation whether they were working toward the independent or interdependent reinforcement criteria. Both baseline and intervention phases consisted of at least five data points per condition.

Results were primarily analyzed via visual analysis. Level, trend, variability, overlap, immediacy and consistency of effect across similar phases were assessed (Kratochwill et al. 2010).

Interobserver Agreement

For praise and reprimands, interobserver agreement (IOA) was calculated by comparing frequency counts within each 10-s interval (i.e., exact count-per-interval; Cooper et al. 2007). The total number of intervals with agreement in frequency were divided by the total number of intervals with agreements plus disagreements, multiplied by 100. IOA for student behavior was calculated by dividing the number of intervals of agreement regarding student behavior divided by the total number of agreements plus disagreements, multiplied by 100 (i.e., interval-by-interval IOA; Cooper et al. 2007). Across participants, IOA was collected for 35.9% of total observations—36.4% in baseline, 30.8% during the independent condition and 40% during the interdependent condition. IOA averaged 96.0% (range = 50–100) for BSP, 98.3% (range = 80–100%) for general praise, 93.6% (range = 66.7–100%) for behavior-specific reprimands and 100% for general reprimands. Due to one instance of IOA below 80% for BSP and behavior-specific reprimands, retraining in observation

procedures was provided. IOA averaged 99.7% (range = 99.2–100%) for AEB and 99.6% (range = 98.3–100%) for DB.

In addition to simple IOA, kappa was calculated. Kappa calculations for the current study were 0.994 for Ms. Jackson, 0.991 for Mrs. Jones, 0.998 for Mrs. Crowley and 0.985 for Mrs. Robinson. All four values indicate a high level of agreement.

Treatment Integrity

Treatment integrity data were collected throughout all phases of the study. Treatment integrity was calculated using a study-derived checklist specific to each phase and intervention condition. During treatment conditions, assessment of integrity comprised reading the correct script that described the contingency in place, provision of feedback regarding teacher behavior, use of script to describe access to reinforcement and the delivery of reinforcement when earned. The checklist was completed by the primary researcher after observing each of the feedback sessions. Treatment integrity was calculated by dividing the number of steps implemented by the number of total steps and multiplying by 100. Treatment integrity was found to be 100% across all phases and intervention conditions. IOA was also collected for treatment integrity for 40% of sessions and was found to be 100%.

Results

Frequency of BSP

During baseline, Ms. Jackson issued low levels of BSP ($M = 3.8$; Fig. 1). During the intervention phase, neither treatment condition emerged as superior for improving BSP. However, both intervention conditions resulted in improved frequency of BSP statements, with the independent condition yielding a higher average ($M = 27.7$) than the interdependent condition ($M = 23.5$). At the conclusion of the intervention phase, levels of BSP greatly exceeded baseline levels in both conditions.

Mrs. Jones demonstrated variable levels of BSP during baseline ($M = 5.2$). During intervention, immediate improvements were observed in the frequency of BSP for both conditions. Although more BSP statements were delivered in the interdependent condition ($M = 24.2$) compared to the independent condition ($M = 20.8$), little visual differentiation between conditions was observed.

During baseline, Mrs. Crowley demonstrated low and stable levels of BSP ($M = 0.4$; Fig. 1). Introduction of the intervention resulted in immediate and substantial improvements in BSP in both intervention conditions. For both conditions, an increasing trend in use of BSP was observed throughout the phase. Overall, the interdependent condition produced a slightly higher average ($M = 29.3$) than the independent condition ($M = 28.6$). However, data were largely undifferentiated across conditions.

Finally, Mrs. Robinson demonstrated low and stable rates of BSP during baseline ($M = 1.8$). Introduction of the intervention conditions resulted in immediate

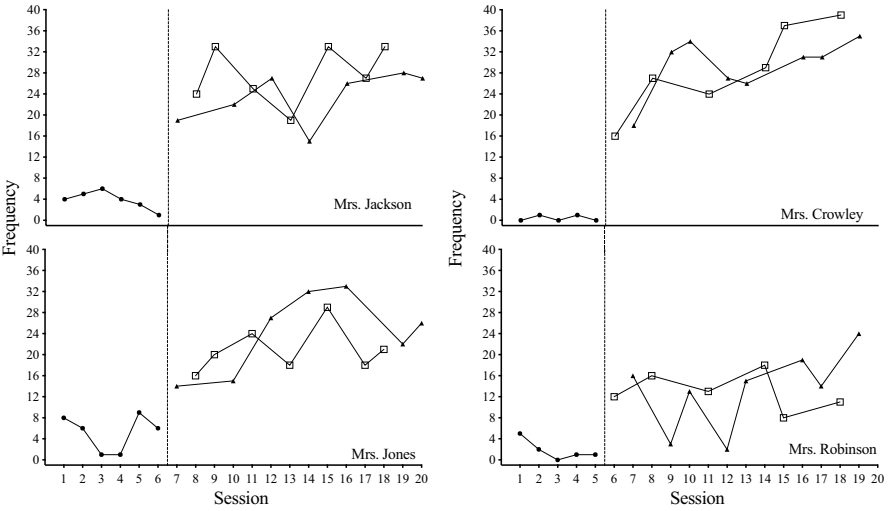

Fig. 1 Frequency of BSP across classrooms. *Note* Open squares = independent group contingency; closed triangles = interdependent group contingency

improvements in the frequency of BSP statements; however, she was the only participant to have reinforcement withheld during the intervention phase. On three occasions, she failed to meet her goal of 10 BSP statements per observation—once during the independent condition and twice during the interdependent. Although similar levels were noted across intervention conditions, with an average of 13.0 BSP statements in the independent condition and 13.3 in the interdependent condition, the independent contingency was associated with more variable frequencies of BSP statements.

Frequency of General Praise

During baseline, variable levels of general praise were observed for Ms. Jackson ($M = 22.0$; Fig. 2). During the intervention phase, an initial increase in general praise was observed in both intervention conditions. The independent condition ($M = 36.4$) and interdependent condition ($M = 33.3$) had similar means across the phase. However, a decreasing trend was observed for both conditions across the intervention phase. At the conclusion of the intervention phase, general praise approximated baseline levels in both conditions.

Mrs. Jones demonstrated variable levels of general praise during baseline ($M = 9.3$). During intervention, the independent condition ($M = 12.7$) resulted in initial improvements that were not maintained over time. The interdependent condition ($M = 5.7$) was not found to result in changes in use of general praise.

During baseline, Mrs. Crowley demonstrated variable and decreasing levels of general praise ($M = 7.8$; Fig. 2). Introduction of the intervention phase resulted in immediate improvements in general praise; however, improvements were variable across the phase and not maintained over time and no differentiation was noted

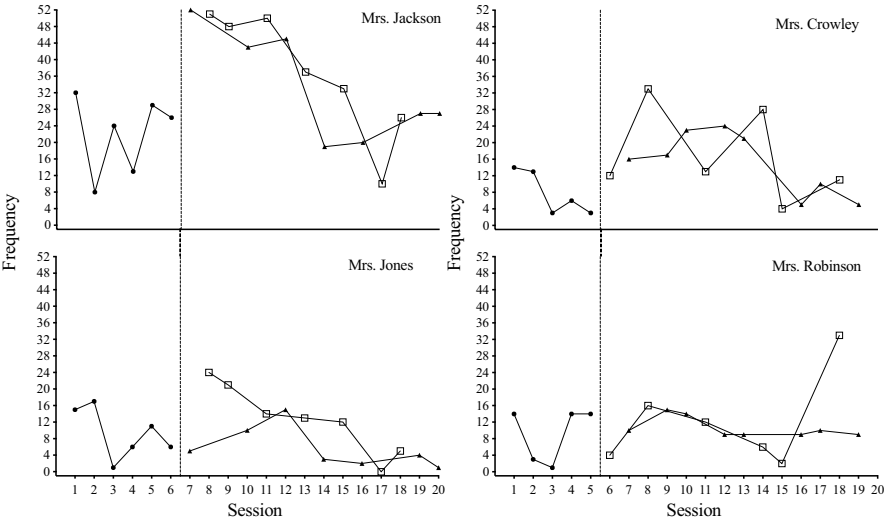

Fig. 2 Frequency of general praise across classrooms. *Note* Open squares = independent group contingency; closed triangles = interdependent group contingency

between the independent condition ($M = 16.8$) and the interdependent condition ($M = 15.1$).

Finally, Mrs. Robinson demonstrated l variable and moderate rates of general praise ($M = 9.2$). Neither the independent condition ($M = 12.2$) nor the interdependent condition ($M = 10.6$) resulted in substantial differences from levels observed in baseline during the intervention phase.

Frequency of Reprimands

During baseline, Ms. Jackson issued high, variable levels of behavior-specific reprimands ($M = 30.8$; Fig. 3), with lower and variable levels of general reprimands ($M = 10.7$; Fig. 4). Upon the introduction of intervention, an immediate decrease in the frequency of behavior-specific reprimands was observed in both the independent ($M = 6.4$) and interdependent conditions ($M = 9.4$)), with a gradual increasing trend observed throughout the end of the phase. General reprimands decreased to near-zero levels in both the independent ($M = 2.7$) and interdependent conditions ($M = 2.7$).

Mrs. Jones demonstrated increasing levels of behavior-specific reprimands ($M = 37.8$; Fig. 3) and general reprimands ($M = 13.8$; Fig. 4) during the baseline phase. Introduction of the intervention phase resulted in immediate decreases in behavior-specific reprimands in the independent ($M = 18.6$) and interdependent ($M = 16.9$) conditions. Little differentiation was noted between intervention conditions. General reprimands decreased to near-zero levels during both the independent ($M = 4.3$) and interdependent ($M = 2.6$) conditions.

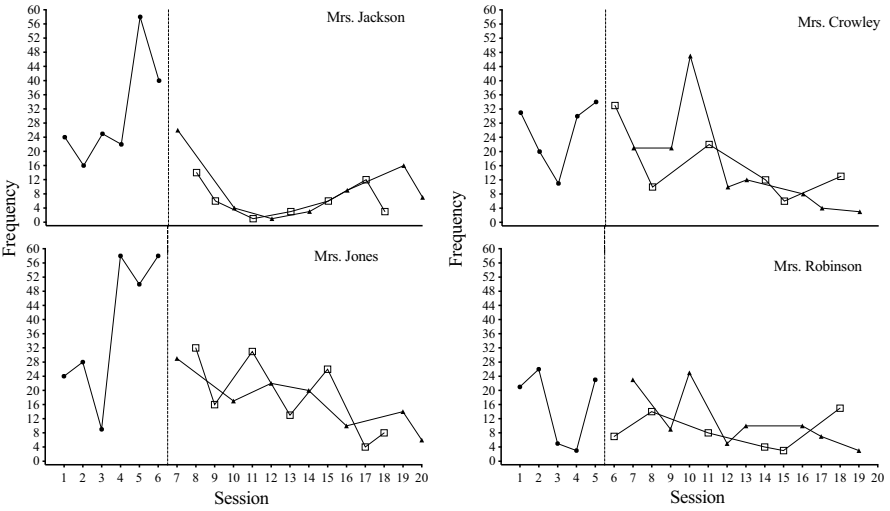

Fig. 3 Frequency of behavior-specific reprimands across classrooms. *Note* Open squares = independent group contingency; closed triangles = interdependent group contingency

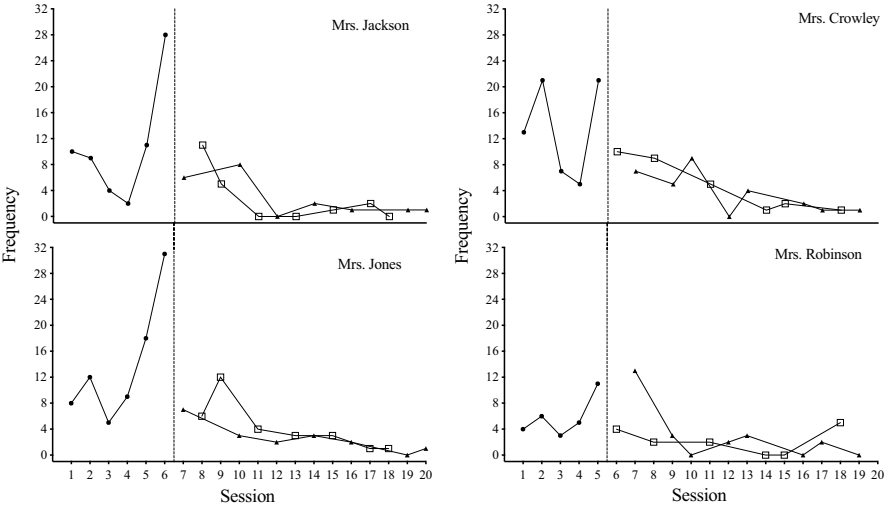

Fig. 4 Frequency of general reprimands across classrooms. *Note* Open squares = independent group contingency; closed triangles = interdependent group contingency

During baseline, Mrs. Crowley demonstrated substantial variability in the use of behavior-specific reprimands ($M = 25.2$; Fig. 3) and general reprimands ($M = 13.4$; Fig. 4). Application of the interdependent group contingency resulted in immediate decreases in behavior-specific reprimands ($M = 15.8$) and general reprimands ($M = 3.6$). Reductions in level were observed for behavior-specific reprimands ($M = 16.0$) or general reprimands ($M = 4.7$) in the independent group contingency.

Both conditions were associated with gradual decreases throughout the phase, with little differentiation between the two conditions.

Mrs. Robinson emitted variable levels of behavior-specific reprimands ($M = 15.6$; Fig. 3) and low levels of general reprimands ($M = 5.8$; Fig. 4) during baseline. Implementation of the independent group contingency resulted in immediate decreases in behavior-specific reprimands *(*$M = 8.5$*),* whereas the interdependent group contingency ($M = 11.5$) was associated with delayed improvements. Despite initial differences, minimal differentiation was observed throughout the phase. Both the independent ($M = 2.2$) and interdependent ($M = 2.9$) conditions were associated with low use of general reprimands.

Student Behaviors

During baseline, Ms. Jackson's students presented decreasing and variable levels of AEB ($M = 32.5\%$; Fig. 5). High levels of DB were observed ($M = 61.1\%$; Fig. 6). Implementation of the intervention resulted in delayed improvements in AEB in both the independent ($M = 57.5\%$) and interdependent ($M = 51.1\%$) conditions. Similarly, gradual decreases in DB were observed in both the independent ($M = 38.2\%$) and interdependent ($M = 43.3\%$) conditions throughout the intervention phase.

Mrs. Jones's students exhibited decreasing levels of AEB ($M = 35.6\%$; Fig. 5) and increasing levels of DB ($M = 58.4\%$; Fig. 6) during baseline. The introduction of the independent ($M = 60.4\%$) and interdependent (52.8%) conditions resulted in immediate, though variable, increases in AEB, with little differentiation between conditions. Similarly, the independent ($M = 36.1\%$) and interdependent ($M = 43.2\%$) conditions were associated with immediate reductions in DB, with some variability evidenced across the phase.

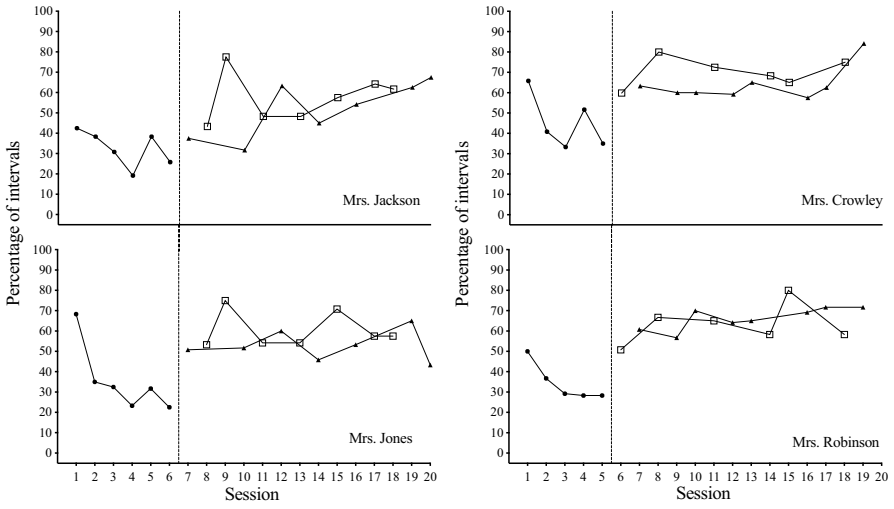

Fig. 5 Percentage of intervals of AEB across classrooms. *Note* Open squares = independent group contingency; closed triangles = interdependent group contingency

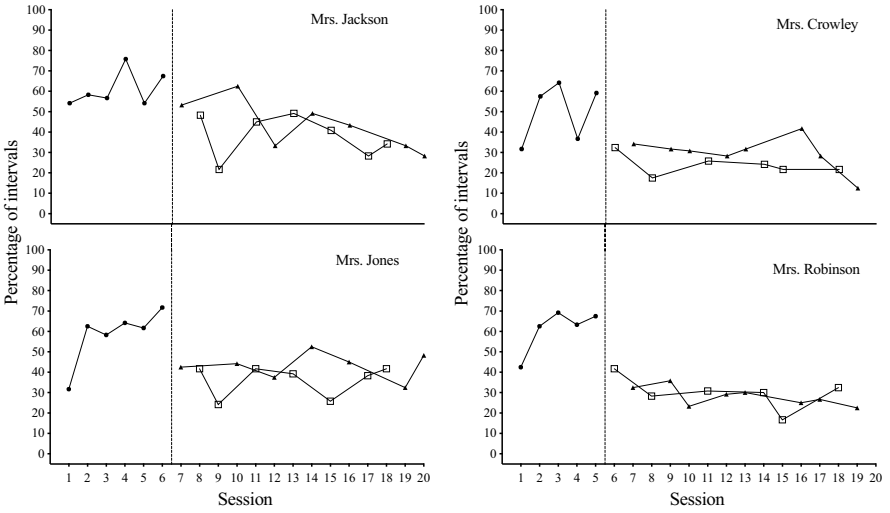

Fig. 6 Percentage of intervals of DB across classrooms. *Note* Open squares = independent group contingency; closed triangles = interdependent group contingency

During baseline, Mrs. Crowley's students exhibited varying levels of AEB ($M = 45.3\%$; Fig. 5) and DB ($M = 49.9\%$; Fig. 6). Upon introduction of the independent ($M = 70.1\%$) and interdependent ($M = 64.0\%$) conditions, AEB immediately increased. Slight differentiation was noted, with the independent group contingency associated with greater levels of AEB. Less differentiation was noted with respect to DB for the independent ($M = 23.9\%$) and interdependent ($M = 29.9\%$). However, both conditions were associated with decreased DB relative to baseline.

Mrs. Robinson's class demonstrated decreasing levels of AEB ($M = 34.5\%$; Fig. 5) and increasing DB ($M = 61.0\%$; Fig. 6) during the baseline phase. Implementation of the independent ($M = 63.2\%$) and interdependent ($M = 66.2\%$) group contingencies resulted in immediate improvements in AEB. Similarly, introduction of the independent ($M = 30.0\%$) and interdependent ($M = 28.1\%$) group contingencies resulted in decreases in DB. These changes exhibited some variability throughout the phase but remained below baseline levels.

Social Validity

At the conclusion of the study, teacher participants were asked to evaluate the social validity of the intervention conditions using the BIRS. Items on the BIRS were rated on a 6-point Likert scale with higher ratings indicating greater social validity. To provide anonymity, teachers were asked not to include their names on the rating scale. For one teacher, the mean item rating was 4.79. The mean item rating was 5.17 for a second teacher. Finally, means of 5.33 were found for the remaining two teachers. All four participants strongly agreed the procedures used in the present study were effective in reducing levels of student problem behavior, were appropriate for changing the behavior of students and did not result in negative side effects

for student participants. Additionally, three of the four participants indicated that they would recommend the present intervention to other teachers in the future.

Discussion

The delivery of praise, particularly BSP, is associated with improvements in student behavior within the classroom (e.g., Blaze et al. 2012; Reinke et al. 2008; Pisacreta et al. 2011). Teacher training in use of praise is often addressed through didactic training—a strategy that has been found to have limited efficacy when implemented in isolation (Dufrene et al. 2012). Prior research has shown the ability of group-based reinforcement contingencies to alter student behaviors, but little has been done to investigate whether similar procedures might be utilized as an alternative to didactic training to improve teacher behavior (Barrish et al. 1969; Hunt 2012; Smith et al. 2013). As such, the purpose of the present study was to compare the efficacy of two group contingency procedures, an independent group contingency and an interdependent group contingency, in promoting the use of teacher praise within the classroom setting. The findings of the present study extend the literature base by showing both an independent and interdependent reinforcement contingency may be utilized to increase teacher use of BSP. Additionally, the present study sought to evaluate the effects increased use of praise in the classroom setting may have on student engagement in both academic and disruptive behaviors. Results show increases in the use of BSP in particular can result in higher levels of academic engagement and decreases in disruption.

Although the current study was designed to determine whether an independent or interdependent reinforcement contingency had a greater effect on increasing teachers' use of BSP, results showed little differentiation between the two treatment conditions. When collapsing mean levels of BSP across all participants and all treatment sessions, the interdependent condition produced slightly higher levels of BSP, both visually and statistically, as compared to the independent condition. As some participants' BSP was found to be more responsive to the independent contingency (i.e., Jackson) and others to the interdependent contingency (i.e., Jones, Crowley and Robinson), findings of the current study indicate individual differences between participants or participant dyads may affect which treatment results in the highest level of improvement.

Despite variability in results across all four participants, the current study supports prior research findings in several ways. Whereas independent reinforcement contingencies have not be used to specifically increase teachers' use of BSP, these contingencies have proven useful in changing other teacher behaviors (Noell et al. 2000). Studies such as DiGennero and colleagues (2007) and Noell and colleagues (2000) relied on the use of negative reinforcement, in the form of meeting cancelation, to improve teacher's levels of treatment integrity. Findings of the present study extend the literature base by showing the use of reinforcement contingencies can not only improve levels of integrity, but also increase teachers' use of BSP. Additionally, the implementation of an independent contingency suggests that not only are

negative reinforcement contingencies effective in changing behavior, but that positive reinforcement may effectively change teacher behavior as well.

In addition to the findings related to the use of independent contingencies, results of the present study have implications regarding the use of interdependent contingencies. Prior to the present study, interdependent contingencies had rarely been used to promote teachers' use of specific behaviors. Smith and colleagues (2013) demonstrated the use of an interdependent contingency to change behaviors of camp counselors at a summer day program for children with disabilities. The present study extends these findings to show interdependent contingencies are not only effective at increasing use of praise in a camp setting with students who have disabilities, but also in a general education classroom during regular classroom procedures.

Although improvements in the use of BSP were seen across intervention conditions, results for each teacher varied in terms of which reinforcement contingency proved more successful. Similar findings have been documented across comparisons of the effects of group contingencies on student behavior (e.g., Gresham and Gresham 1982; Little et al. 2009). More recently, Little et al. (2015) conducted a meta-analysis of the effects of the three types of group contingencies on student behavior with results suggesting that all types of group contingencies may be considered to be efficacious. Given that little differentiation was noted between the independent and interdependent group contingency, the current study provides preliminary evidence that both types of group contingencies may be useful in increasing teacher delivery of BSP.

Regardless of intervention conditions, improvements in both AEB and DB were observed in each of the participating teachers' classrooms. Although several of the teacher participants presented higher levels of general praise in baseline than those found in previous studies (e.g., Reinke et al. 2013; White 1975), low levels of AEB were still present. The increases in BSP and concurrent improvements in student behavior are consistent with previous literature suggesting the use of BSP rather than general praise is more effective in producing desired student behaviors (Chalk and Bizo 2004). Thus, as teachers' use of BSP increased, not only did DB decrease, but AEB increased. These findings provide further support for the notion that the provision of BSP is useful in teaching positive replacement behaviors to students. Relatedly, White (1975) noted teachers were more likely to engage in very low levels of BSP, yet higher levels of behavior-specific reprimands. In keeping with findings of past research, the present study noted higher rates of behavior-specific reprimands rather than BSP during baseline. Consistent with previous research, data collected during the intervention phase of the current study indicated that increases in praise were associated with concomitant decreases in reprimands, whether behavior-specific reprimands or general reprimands (e.g., Reinke et al. 2008).

Previous research has found that teachers perceived the use of group contingencies as a socially valid means of addressing student behavior (e.g., Thorne and Kamps 2008). When asked to rate the acceptability of group contingency procedures applied to themselves, teacher participants responded slightly to strongly agree when asked whether they enjoyed the procedures used in the current study. Although replication of these findings is necessary, these data provide initial support for the acceptability of such procedures for use within school settings.

Limitations and Future Directions

Though all four participants demonstrated improvements in levels of BSP during the intervention phase of the present study, several limitations must be noted. First, although examination of individual participant data reveals which of the two intervention conditions resulted in greater change per participant, these changes were not consistently demonstrated across participants or even pairs. Future research and replication are needed to determine whether extending the treatment phase would result in increased differentiation between reinforcement conditions. Similarly, future research is needed to examine other factors that may be relevant when evaluating the effectiveness of each treatment contingency (e.g., teacher variables, classroom variables). In the case of the present study, experimental design may have played a role in reducing the differentiation observed between treatment conditions. Though participants were told of the condition in place for any given session, multiple treatment interference may still have occurred. Future research may choose to replicate the study using a different experimental framework in an effort to further differentiate between the independent and interdependent contingencies. Additionally, the social validity survey administered to participants did not seek to identify participant preference for the two reinforcement contingencies. Given previous research indicating teacher preference for implementing independent group contingences (Ennis et al. 2016), future researchers should consider assessing whether a similar preference is noted for procedures seeking to increase teacher use of BSP.

Additionally, experimental design choice for the present study did not allow for determining the effects the didactic portion of training may have had. Future research may consider adding an additional phase between baseline and treatment introduction in which data are collected following the didactic training alone. The addition of this phase would allow researchers to determine the extent to which didactic training versus the addition of reinforcement affected the primary variable—teachers' use of BSP.

Another limitation of the study is the generalizability of findings. The small sample size and limited range of demographic diversity in participants, both teachers and students, makes it difficult to determine whether replication of the study with a different population would yield similar findings. Future research should consider replicating the present study with teacher and student populations unlike those used in the study.

Because the current study relied on tangible reinforcement such as notepads, pencils, sticker pads, dry-erase markers and sticky notes being presented following goal completion, it may be difficult for some school districts to implement this intervention due to the availability of resources. The primary author spent between \$0.25–\$2.50 per preferred item for a total cost of \$85 throughout the study. As such, future researchers should consider investigating reinforcement contingencies that involve non-tangible stimuli for teacher participants. Potential non-tangible stimuli may consist of administration covering a teacher's recess duty for a day, praise in a school newsletter or wearing jeans on a particular day (e.g., Riffel 2011).

The role of negative reinforcement must also be considered as it pertains to behavior change. Although the contingency implemented provided participants with

positive reinforcement as a means of promoting behavior change, negative reinforcement in the form of escaping challenging student behavior may also functioned as a mechanism of behavior change. Future researchers may consider use of experimental designs that allow for analysis of contributions of both positive and negative reinforcement separately.

Finally, it is unknown whether the resulting improvements in both teachers' use of BSP and student behaviors would last over time. Future researchers should consider the inclusion of a maintenance or follow-up phase to evaluate whether changes in teacher and student behavior persisted following removal of the contingency conditions.

Conclusions and Implications for Practice

Although the results of the current study must be considered in light of several limitations, the data indicate that both an independent and interdependent reinforcement contingency were effective in increasing teachers' use of BSP. Positive changes in student behavior were also noted during both intervention conditions. Because neither contingency emerged as dominate across all four participants, consultants may find value in the use of either treatment condition when seeking to increase the use of BSP or reduce disruptive classroom behaviors. While the independent condition is less resource intensive in that any teacher in need of consultation may begin to access reinforcement without the need for a partner, a school with a strong team-based dynamic previously in place may better benefit from use of the interdependent contingency. Consultants should weigh the pros and cons specific to individual teachers and the districts in which they practice before choosing to implement one or both of the treatment conditions found in the present study. Although one contingency did not emerge as consistently superior, the four participants found both intervention conditions to be socially valid and effective in improving the overall classroom environment.

Compliance with Ethical Standards

Conflict of interest All authors of the study report no conflict of interest.

Ethical Approval All procedures performed in the current study were in accordance with the 1964 Helsinki Declaration and its later amendments.

Informed Consent Informed consent and assent was obtained from all individual participants included in the study.

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