The Differentiated Effects of Specific Praise Rates on the On-Task Behavior of Elementary Students with Autism

THESIS

Presented in Partial Fulfillment of the Requirements for the Degree Master of Arts in the Graduate School of The Ohio State University

By

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2016

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Abstract

Using contingent praise can serve as a proactive strategy for increasing on-task behaviors in special education classrooms. Although there is large body of literature supporting the use of praise to decrease challenging behaviors and increase desirable behaviors (e.g., Myers, Simonsen, & Sugai, 2011; Piscareta, Tincani, Connell, & Axelrod, 2011; Stichter et al., 2009), a consensus on how much praise is needed has yet to be reached. In an effort to determine optimum rates of praise, this study used an alternating treatments design to examine the comparative effects of 1 teacher-delivered praise statement per minute, 4 per minute, and 8 per minute on the on-task behavior of elementary-aged students with autism. The results varied across participants but overall indicated that 4 or more specific praise statements per minute resulted in higher percentages of intervals of on-task behavior than 1 praise statement per minute.
This thesis is dedicated to my incredible, always supporting mother who has supported me in all of my endeavors since I can remember. No words I can describe how thankful and grateful I am.
Acknowledgments

I would like to thank and acknowledge my advisor, Dr. Sheila Alber-Morgan for her guidance and unwavering support during this project. I would also like to thank Dr. Nancy Neef and Dr. Mary Sawyer for their essential input regarding methodology and overall thoughts and feedback regarding this research. Last, I would like to thank my data collectors: Lauren Hensley and Natalie Andzik, and the classroom teacher Colleen Vaughn for being such an integral part in this thesis.
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Fields of Study

Major Field: Educational Studies

Area of Emphasis: Special Education, Applied Behavior Analysis
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CHAPTER 1

INTRODUCTION

Education has a long history of being driven by fads and philosophies that are not supported by empirical research. Much to the detriment of our students, many teaching practices are selected based more on popular appeal than on empirical evidence that they actually work. For example, in a 2001 article in Young Children, Alfie Kohn condemned educators’ and parents’ use of praise. Specifically, Kohn stated that praise makes children feel manipulated, creates “praise junkies”, steals a child’s pleasure, makes children lose interest, and decreases their achievement. However, he provided no empirical evidence to support the claims he was making. Despite decades of empirical research demonstrating the effectiveness of praise for increasing appropriate behavior, achievement, and intrinsic motivation (e.g., Cameron & Pierce, 1994; Hall et al., 1971; Noell et al., 2005; Odom & Strain, 2002), Kohn’s faulty recommendations persist.

By following recommendations for practice that are not based on empirical evidence, practitioners may be providing ineffective instruction and interventions to their students. Ultimately, it is the students who are most affected by the unsupported claims.
To this end, it is important that researchers provide evidence for their recommended practices and guidelines.

**Early Praise Literature**

Teachers’ use of praise has been the subject of empirical research since the 1970s. For example, Hall et al. (1971) explored the role of a teacher serving as the intervention agent in the systematic delivery of contingent praise and planned ignoring for a 10, 13, and 15-year-old male with mental retardation in a self-contained classroom with 15 males with mental retardation. The intervention targeted arguing, talk outs, and noncompliance. Hall et al. (1971) used a reversal design in which baseline consisted of instruction, praise, and reprimands as usual. In the intervention phases, the teacher ignored any talking-out or protesting from the student. She delivered immediate, specific praise if the student started work on an assignment immediately following its presentation. Hall et al., found that delivering specific praise targeting appropriate behavior and ignoring less desirable behavior was effective at increasing the desirable behavior and decreasing the problem behavior. The data indicated that target behaviors across all participants were reduced to zero occurrences per day following intervention.

In contrast to Hall et al. (1971), White (1975) observed and recorded only the naturally occurring rates of praise of 16 teachers from first-to-twelfth grade; no data were taken on student behaviors. White’s results indicated that praise descended from 43.7 praise statements per hour in elementary classrooms to 8.4 praise statements per minute in high school classrooms. The results of White provided astonishing data as far as teacher rates of naturally occurring praise; however, it could have been much more
fruitful to also have taken data on student behaviors and outcomes across those classrooms.

Similar to White (1975), Thomas, Presland, Grant, and Glynn (1978) observed 10 seventh grade teachers and recorded their natural rates of praise and reprimands. An average of 30 students were in each classroom. Thomas et al. found that seven of 10 participating teachers delivered corrective feedback as much as three times frequently than they delivered praise. These results not only set the stage for further investigation of the use of praise, but also for the improvement of teacher’s praise rates and ratios. In their discussion, the authors stated that behavioral interventions should be researched in order to improve rates of teacher praise.

The results of these three studies illustrate some of the following contributions of early praise research. Praise rates can be highly variable. Not only can rates of praise vary greatly across similar grade classrooms, but also on a spectrum from elementary-aged students to high school-aged students. Even though previous research has shown varied rates of praise, the research presented above (excluding White, 1975) indicates that praise can be an effective, proactive classroom management tool. Studies to date have recommended further examination of rates of praise and their prevalence and use in classrooms. In order to support claims that higher rates of praise are most effective, research must be conducted to determine the extent to which a functional relation exists between specific rates of praise and student on-task behavior.
Effectiveness, Importance, and Use of Praise

Early research has demonstrated the utility of praise on the prevention of problem behavior. Proactive classroom management skills are essential for maximizing instructional time and improving student outcomes. Proactive strategies, such as frequent use of contingent praise, are implemented to prevent or decrease the occurrence of challenging behavior. Conversely, reactive strategies consist of implementing consequences after the challenging behavior has already occurred. Clunies-Ross, Little, and Kienhuis (2008) found that predominant use of reactive behavior management was associated with increased off-task student behavior and self-reported teacher stress and burn out. According to the National Center for Education Statistics (2000), 40% of surveyed teachers reported managing challenging behavior as the biggest factor affecting instruction. With the ever-increasing importance of student success and teacher retention, it is critical that teachers are equipped with proactive behavior management strategies. Praise is one of the most commonly used and powerful behavior management tools that special education teachers have at their disposal (Stichter et al., 2000).

The majority of classroom praise studies have had the goal of increasing teachers’ praise rates. Noell et al. (1997, 2005) further investigated teacher adherence to behavior treatment plans that incorporated the use of praise. They found that most teachers (44 participants) typically did not follow the protocol for delivering specific praise. Noell et al. (1997, 2005) implemented a coaching and performance feedback model to increase the participating teachers’ rates of praise. Results indicated that coaching and feedback improved teacher praise rates and subsequently resulted in improved student behavior.
Overall, increasing teachers’ rates of praise can have many advantages. Strain and Joseph (2004) compiled into one article many of the benefits praise can have in regards to students, as well as its effectiveness. First and foremost, praise is an evidence-based practice that is one of the easiest tools for teachers and practitioners to implement. It can be a simple, yet effective form of positive reinforcement. Strain and Joseph (2004) state that behavior-specific praise is more desirable than general praise. The use of praise with children can also serve as a model for future behavior; the children themselves can possibly learn how to provide praise by being praised. Praise is often times used most frequently with younger students, but it could still be effective with older kids. One way to combat its lack of use in older grades is to change the wording from “praise” to “acknowledge” (R. Detrich, personal communication, October 9, 2015).

Although praise can be effective on its own, it can yield similar, positive benefits when used in combination with other behavior analytic techniques. Gable, Hester, Rock, and Hughes (2009) reaffirmed that the use of praise, particularly specific praise, is an effective evidence-based practice for classroom management. Particularly, Gable et al. (2009) focused on the combination of classroom rules, specific praise, ignoring, and reprimands. Visible, succinct classroom rules can serve as an effective antecedent intervention in the management of classroom behavior. By combining praise for a specific, desirable behavior with planned ignoring of a less desirable behavior; teachers and intervention agents could have been implementing a differential reinforcement of alternative or differential reinforcement of other behavior procedure without even
realizing it. Praise can also help enhance the student-teacher relationship and help establish the teacher him or herself as a conditioned reinforcer.

**Praise Rate Recommendations**

Researchers and practitioners have estimated optimal praise rates in research designed to examine the effects of praise on both on-task and off-task behavior. Brophy (1981) recommended empirical studies to support a rate at which praise should be delivered. He specifies three qualities teacher praise must have in order to serve as reinforcement. First, praise must be contingent on the emittance of the behavior to be reinforced. Second, the praise must be specific to the person and the behavior being praised. Last, the praise should be varied and credible based on the situation and setting.

Sutherland et al. (2000) investigated the effects of contingent praise on the on-task behavior of nine fifth grade students with emotional and behavioral disorders (EBD) within a self-contained classroom. Their goal was to increase the teacher’s rate of both specific and generic praise statements. The experimenters used a reversal design in which the intervention consisted of the experimenters delivering feedback to the teacher following observations. Moreover, the experimenters provided additional feedback prior to the next observation, reminded the teacher of the benefits of behavior-specific praise, and reminded him that the goal was to use a higher rate of specific praise. The results of Sutherland et al. (2000) indicated that feedback is an effective intervention to increase teacher rates of specific praise; furthermore, the data showed higher intervals of on-task behavior for students during intervention when the teacher was delivering a higher rate of specific praise. Although Sutherland et al. (2000) provided more evidence that higher
rates of specific praise are more effective than lower rates, they did not provide any hard recommendations or guidelines for how much praise is necessary.

In comparison to Sutherland et al. (2000), Pisacreta, Tincani, Connell, and Axelrod (2011) addressed the question of how much praise is needed by examining the effects of a 1:1 ratio of praise statements to corrective feedback statements. Pisacreta et al. (2011) used modeling and feedback to train three middle school teachers to provide a 1:1 ratio of praise statements to corrective feedback statements and examined the effects of this training on teachers’ adherence to the 1:1 ratio, intervals of student disruptive behavior, and teachers’ generalization to classrooms where no training occurred. A multiple baseline across participants design showed that in baseline teachers typically provided about 1 praise statement per every 10 corrective feedback statements. After training, which consisted of modeling and feedback, the teachers increased their praise to corrective feedback ratios to closer to 1:1 (ranging between 1:4 and 4:1) and two of the teachers demonstrated generalization of the trained praise ratio to other classrooms. Additionally, student disruptive behavior decreased substantially after intervention. During baseline, mean intervals of off-task behavior for each classroom ranged from 22% to 44%. After training, mean intervals of disruptive behavior decreased to means of 11% to 18%. Based on the limitations of their study, one of the recommendations of Pisacreta et al. was to conduct a parametric analysis examining the effects of different praise rates.

Similar to Pisacreta et al. (2011), Myers, Simonsen, and Sugai (2011) sought to improve rates and ratios of specific praise for four teachers in a middle school that was implementing Schoolwide Positive Behavior Support (SWPBS). Myers et al. (2011) used
multi-tiered levels of support to train teachers to attain six specific praise statements per 15 minutes (based on Sutherland et al., 2000) and ratios of four positive to one negative interaction with students. A multiple baseline across participants design demonstrated that the multi-tiered system was effective for training teachers to criteria and for decreasing student disruptive behavior.

The research of Pisacreta et al. (2011) and Myers et al. (2011) demonstrated that teachers can be trained to deliver praise at increased rates and that those increased praise rates resulted in decreased off-task behavior. However, the optimum number of specific praise statements has not yet been established. Although a 4:1 ratio of praise to corrective feedback has been recommended (e.g., Trussell, 2008), there has been no published research comparing different praise rates on student behavior. The purpose of this study was to conduct a parametric analysis of praise rates by examining the differential effects of those praise rates on student behavior. The following research questions guided this investigation.

1. What are the differentiated effects of various rates of praise on the on-task behavior of elementary-aged students with autism?
2. What is the teacher’s opinion about the effectiveness and feasibility of the various praise rates?
CHAPTER 2

METHOD

Participants and Setting

Participants were five males, ages 7 to 10, enrolled in a special education program at a private school for children with autism spectrum disorder (ASD) in a large Midwestern city. All participants were diagnosed with autism; Ned was also diagnosed with Sensory Processing Dysfunction. All participants functioned academically at the first to second grade level. Some participants engaged in forms of aggression such as hitting and pinching the teacher, cursing, and engaging in noncompliance and elopement. All five participants spent most of school day in the same classroom with the lead teacher and her aide. Their daily routine consisted of Direct Instruction (DI) curricula and fluency building programs for reading and math. Participants also attended other classes including physical education, science, and library. Table 1 shows demographic and school related information about the participants. The classroom teacher was a 29 year-old female with a bachelor’s degree in special education and one year of teaching experience.
Observations occurred 9:30 to 9:50 a.m., Monday through Friday, in the same classroom. The classroom was 30 x 15 feet and included six student desks arranged in a semi-circle, oriented towards a dry erase board and one teacher desk. Reading board work and fluency tasks were the focus of instruction during observations. Specifically, the teacher delivered DI reading instruction by presenting nonsense syllables on the board, signaling for students to decode each syllable by tapping under the syllable, and providing praise or corrective feedback. Fluency instruction consisted of timed practice reading nonsense syllables on worksheets.

**Dependent Variable**

The dependent variable measured for students was on-task behavior. On-task behavior was defined as looking at the teacher during teacher-led instruction, looking at and/or writing responses on a worksheet, answering questions on signal, and following teacher directions. Student behavior data were recorded using a pencil and experimenter-designed data sheets. A momentary time sampling procedure was used to score on-task behavior. The daily observation time of 20 minutes was divided into 10-sec intervals. At the end of the each 10-sec interval, the observer recorded a “✓,” (check) if the student was on-task or a “0,” (zero) if the student was not on-task. Percentage of on-task intervals was calculated by dividing the number of intervals of on-task behavior by the total number of intervals and multiplying by 100.

**Treatment Integrity**

Teacher praise statements were recorded for the purpose of assessing treatment integrity. The teacher was instructed to deliver a specific praise statement every 60 s, 15
s, or 7 s depending on that day’s condition and used a MotivAider® as a prompt to deliver praise at each interval. Similar to Myers et al. (2011), a specific praise statement was recorded when the teacher emitted a verbal statement of approval (e.g., “good job,” “well done,” “excellent”), indicated the behavior being praised (e.g., answering a question correctly, paying attention), and stating either the student’s name or saying “everyone” when addressing the whole group. General praise statements that did not specify the behavior or the individual(s) being addressed were not recorded.

**Observer training.**

Prior to data collection, the primary observer (i.e., the first author) trained observers by showing them recorded sessions from pre-baseline observations, having them score intervals of on-task behavior, and then calculating point-by-point IOA with the primary observer’s original data and discussing any discrepancies. Only one two-hour training session was needed for observers to be trained to mastery criteria for IOA which was 90% agreement across two consecutive sessions. During that same session, the first author also provided training on procedural fidelity by showing the observers the procedural checklist, providing a description of each step, modeling each step, providing opportunities to practice, and delivering feedback. All observers were able to score procedural reliability to 100% accuracy during that training session.

**Interobserver Agreement (IOA)**

**Student on-task behavior.** IOA data were collected on 33% of baseline sessions and 33% of praise rate manipulation (PRM) sessions independently by secondary observers who watched recorded sessions and scored the number of intervals of on-task
behavior for each participant. The secondary observers’ data were compared to the primary observer’s data to assess agreement. IOA was calculated by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100.

**Teacher praise statements.** Teacher praise statements for each session were recorded to ensure the teacher was adhering to the procedures for each PRM condition. IOA of praise statements was assessed on 33% of the PRM sessions. Secondary observers’ data were compared to the primary observer’s data to assess agreement. IOA of teacher praise statements was calculated by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100.

**Procedural Fidelity**

On 66% of experimental sessions, a trained, independent observer watched video recorded sessions and scored procedural fidelity by using a three-step (baseline) and four-step (PRM) experimenter-created checklist. The observer watched the recordings and scored “yes” or “no” for each step depending on whether or not the experimenter followed each of the procedural steps for delivering instructions to the teacher correctly.

**Social Validity**

At the end of the study, the teacher completed a social validity questionnaire by writing responses to the following questions: Which praise rate per minute did you feel was the easiest to implement and why? Which praise rate per minute did you feel was the hardest to implement and why? Which praise rate per minute did you feel resulted in your students being on-task the most and the least? Do you think you will now use an
increased rate of specific praise following this study, why or why not? What were some of the biggest challenges and/or concerns you have about the manipulation of your praise rate?

**Experimental Design**

An alternating treatments design was used to examine the differentiated effects of specific praise rates on the participants’ on-task behavior during teacher directed reading instruction. After three data points were collected during an initial baseline phase, the PRM phase was introduced. In the PRM phase, three different experimental conditions were introduced and alternated in random order. The conditions were as follows: (a) 1 teacher praise statement per minute, (b) 4 teacher praise statements per minute, and (c) 8 teacher praise statements per minute.

**Procedures**

**Baseline.** During baseline, the teacher was provided with no instructions regarding delivery of praise, she was only instructed to teach that day’s lesson as she usually would. During each 20-min baseline session, the observer recorded on-task behavior using the momentary time sampling procedure described under Dependent Variables above. The observer also recorded the total number of teacher praise statements to calculate praise statements per minute.

**PRM.** During the PRM phase, the teacher wore a MotivAider® that was pre-set to vibrate at fixed intervals to prompt her to deliver a praise statement to the students. As in baseline, the observer continued to record on-task behavior and teacher praise
statements. The following three conditions were randomly alternated to compare their effects on student on-task behavior.

**One praise statement per minute (1 per min).** The experimenter set the MotivAider® to vibrate every 60 s and informed the teacher that session’s praise rate was 1 per min. He instructed the teacher to deliver specific praise to either an individual or to the whole class every time the MotivAider® vibrated. The teacher clipped the MotivAider® to her belt loop and switched it to “on” at the beginning of the 20 min observation period. At the end of the observation period, the teacher turned off the MotivAider®, returned it to the observer, and continued teaching.

**Four praise statements per minute (4 per min).** All procedures were the same as above except that the MotivAider® was set to vibrate every 15 s and the experimenter informed the teacher that session’s praise rate was 4 per min.

**Eight praise statements per minute (8 per min).** All procedures were the same as above except that the MotivAider® was set to vibrate every 7 s and the experimenter informed the teacher that session’s praise rate was 8 per min.
Table 1: Participant Demographics

<table>
<thead>
<tr>
<th>Student</th>
<th>Age</th>
<th>Chronological Grade Level</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ned</td>
<td>10</td>
<td>4</td>
<td>White</td>
</tr>
<tr>
<td>Baer</td>
<td>7</td>
<td>2</td>
<td>White</td>
</tr>
<tr>
<td>Eddie</td>
<td>9</td>
<td>3</td>
<td>African American</td>
</tr>
<tr>
<td>Reginald</td>
<td>7</td>
<td>2</td>
<td>White</td>
</tr>
<tr>
<td>Austin</td>
<td>10</td>
<td>4</td>
<td>Other</td>
</tr>
</tbody>
</table>
CHAPTER 3
RESULTS

Figure 1 shows the mean percentage of intervals of on-task behavior for all five students during baseline and PRM conditions. During the PRM phase, the data path in the 1 per min condition is around 80% with little variability, and is clearly below the levels in the 4 per min and 8 per min data path. The 4 per min data path ranged between 88–92% with one overlapping data point over the 8 per min data path, little variability, and clearly above 1 per min and below 8 per min. The level for 8 per min was around 90–95% with little variability and one overlapping data point with the 4 per min data path. The class was on-task for an average of 67% of intervals during baseline (range, 57–73%). During the 1 per min condition, the class was on-task for an average of 77% of intervals (range, 71–83%). During the 4 per min condition, the class was on-task for an average of 86% of intervals (range, 81–92%). During the 8 per min condition, the class was on-task for an average of 91% of intervals (range, 87–96%). Table 2 provides a summary of average percentage of intervals of on-task behavior and their ranges, respectively.
Figures 2, 3, and 4 present Eddie’s, Reginald’s, and Ned’s data respectively. These three participants all demonstrated differentiated percentages of on-task behavior based on the teacher’s praise rate. Eddie, Reginald, and Ned’s data all demonstrated higher percentages of on-task behavior at 4 and 8 praise statements per min compared to 1 praise statement per min, with 8 per min resulting in the highest rate of on-task behavior.

Figures 5 and 6 present Baer and Austin’s individual percentages of intervals of on-task behavior during baseline and PRM conditions, respectively. Both students’ data levels for all three conditions were at about 100% with no variability.

Treatment Integrity

Figure 7 shows the teacher’s specific praise rates per minute during baseline and the PRM conditions. During baseline, her average rate of praise per minute was 1.31 (range: 0.8–1.8 per min). For the 1 per min condition, she maintained a rate of 1 specific praise statement per min. For the 4 per min condition, she maintained a rate of 4 praise statements per minute for five out of six sessions ($M = 3.94$ per min; range, 3.75–4 per min). For the 8 per min condition, the teacher’s mean praise rate was 7.06 per min (range, 6.6–7.5 per min).

Within Session Analysis

Figure 8 shows Reginald’s percentages of intervals on-task from each one, four, and eight per minute session. Analysis of within session data indicated there were no within session trends or patterns for any of the praise rate conditions.

Social Validity
On the social validity questionnaire, the teacher reported that the 4 per min praise rate was the easiest to implement because it was the most similar rate of praise that she typically used and it allowed her to praise and reinforce more occurrences of desirable behavior. The teacher reported that the 1 per min praise rate was the most difficult to implement because if a behavior that she wanted to reinforce was emitted during that one minute interval, in order to comply with treatment integrity, she could not deliver a praise statement. She also stated 1 praise statement per minute was probably least effective for maintaining on-task behavior. “Many times the students would point out that they were following directions, but did not receive praise for it (e.g., "What about me? I'm sitting in my seat too?").” She also indicated that she will “absolutely!” use an increased rate of praise in the future.

In response to which praise rate resulted in her students being on-task the most, the teacher said it depended on the student, but 4 per min seemed to be the best praise rate overall. She also stated that the ideal praise rate “may depend on establishing operations or if the students were working for a special reinforcer that day” (e.g., "Santa's Workshop,” a small-item shop where they spend their tokens during the month of December). Finally, the teacher reported that she had been using more specific praise outside of the study's observations and her rate of specific praise is definitely close to 4 per min.

**Interobserver Agreement.** IOA data were collected for 33% of baseline sessions and 33% of PRM sessions. IOA for baseline was 74%. Average IOA for PRM was 87%
(range, 76%–94%). IOA on the teacher’s praise rate was 100% for both baseline and PRM conditions.

**Procedural Fidelity.** Procedural fidelity data were collected for 66% of baseline sessions and 33% of PRM sessions. Procedural fidelity was 100% for baseline and 100% for PRM.
Figure 1. Whole class percentage of intervals on-task.
Figure 2. Eddie’s percentages of intervals on-task.
Figure 3. Reginald’s percentages of intervals on-task.
Figure 4. Ned’s percentages of intervals on-task.
Figure 5. Baer’s individual percentages of intervals on-task.
Figure 6. Austin’s individual percentages of intervals on-task.
Figure 7. Carolyn’s rates of specific praise between conditions and phases.
Figure 8. Percentage of intervals on-task within sessions. Each data path represents a session per condition.
Table 2. Average, individual percentages and ranges of intervals on-task.

<table>
<thead>
<tr>
<th>Student</th>
<th>Baseline (range)</th>
<th>One per Min (range)</th>
<th>Four per Min (range)</th>
<th>Eight per Min (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eddie</td>
<td>46 (range, 24–68)</td>
<td>48 (range, 35–66)</td>
<td>76 (range, 53–99)</td>
<td>94 (range, 89–100)</td>
</tr>
<tr>
<td>Reginald</td>
<td>39 (range, 29–54)</td>
<td>48 (range, 35–66)</td>
<td>65 (range, 53–99)</td>
<td>67 (range, 47–84)</td>
</tr>
<tr>
<td>Baer</td>
<td>91 (range, 87–96)</td>
<td>100 (range, 98–100)</td>
<td>100 (range, 99–100)</td>
<td>100</td>
</tr>
<tr>
<td>Austin</td>
<td>78 (range, 63–88)</td>
<td>97 (range, 93–100)</td>
<td>99 (range, 98–100)</td>
<td>100</td>
</tr>
<tr>
<td>Ned</td>
<td>73 (range, 61–80)</td>
<td>78 (range, 67–83)</td>
<td>90 (range, 87–97)</td>
<td>93 (range, 87–97)</td>
</tr>
<tr>
<td>Whole Class</td>
<td>67 (range, 57–73)</td>
<td>77 (range, 71–83)</td>
<td>86 (range, 81–92)</td>
<td>91 (range, 87–96)</td>
</tr>
</tbody>
</table>
**Eddie**

Between two baseline observations, Eddie showed an increase of on-task behavior from around 20% to 60% on task. During the PRM condition, the 1 per min data path’s level is around 50% with some variability in the second data point, but has a decreasing trend following that point; it has one overlapping data point with 4 per min. The 4 per min data path is most variable path on the graph. Its level is between 70–80% and is stable following the third data point. The 8 per min data path’s level is around 90–95% with no variability and one overlapping data point with 4 per min.

**Reginald**

Between the first and second baseline sessions, there was a downward trend from 38% to 25% on-task. There was a slight upward trend between the second and third session from 25% to 58%. During the PRM condition, the 1 per min data path has a descending trend from the first to third data point and levels off for the rest of the data points around 50%. Four per min’s data path has little variability and its level is stable at 60–70%. Eight per min’s level was around 60% with some overlap and variability, but had an increasing trend for the last three data points.

**Ned**

During baseline, Ned had a downward trend from 80% to 59% of intervals on ask. In the PRM condition, the level for 1 per min is around 80% with little variability and a decreasing trend towards the end of the PRM condition. The data paths for 4 and 8 per min are very similar. Their levels are around 90% with little variability. Four per min also has an upward trend towards the end of the PRM condition
Baer and Austin

During baseline, Baer’s percentage of intervals on-task declined from just below 100% and stabled out around 85%; Austin’s percentage of intervals on-task declined from 80% to 60% between the first and second baseline observation and increased to around 70% during the third session. During the PRM phase, students’ data’s levels for all three conditions were at 100% with no variability.
CHAPTER 4
DISCUSSION

This study contributes to the body of literature examining praise as a behavior management tool and reinforcer that special educators employ. However, unlike previous studies, the current experiment yielded empirical data that should influence the basic praise rule of, “one should use four praise statements per minute.” Rather than attempt to increase the teacher’s rate of praise or the students’ on-task behavior, the goal was to observe what differences, if any, the various rates of praise had on the students’ behavior.

The results of this study indicate that higher rates of specific praise do result in higher rates of on-task behavior. It addressed the limitations of previous studies by directly attempting to show a functional relation between praise rates and on-task behavior.

**Research Question 1: Differentiated Effects of Various Praise Rates**

The data show that 1 praise statement per min resulted in the lowest percentage of on-task behavior. Four per min and 8 per min both resulted in higher percentages of on-task behavior; 8 per min resulted in a slightly higher level and percentage of on-task behavior than 4 per min. All current studies recommend either 4 praise statements per min or 6 per 15 min (2.5 per min). The data indicate that yes, 4 per min results in a higher
rate of on-task behavior than 1 praise statement per min. However, 8 per min resulted in even higher percentages of on-task behavior than 4 per min.

The data indicate that 4 per min is not the best recommendation for a praise rate. The issue now is: what percentage of on-task behavior is needed for student success? One could assume that the more a student is on-task, the better he or she will perform. Also, the more a student or entire class is on-task, the less he, she, or they are disrupting one another or the teacher and interrupting instructional flow. For studies now to say concretely that 4 per min is the best rate would not be best practice given the data and implications from the current study.

**Research Question 2: What praise rate do teachers find most feasible?**

According to the social validity questionnaire, the teacher that participated reported that 4 per min was the most feasible because it was close to the rate she typically uses (although baseline observations say otherwise). She also stated that it felt more natural and allowed to provide more genuine, enthusiastic praise statements. With the 1 per min condition, she could not reinforce as many desirable behaviors as she would have liked. With 8 per min, it because a hassle for her to find either a new student to praise or a new group behavior to praise each time she was signaled to deliver a praise statement.

**Limitations and Future Research**

The limitations of this study were related to baseline, treatment integrity, IOA, ceiling effects, possible carryover effects, reprimands, quality of praise, and external validity.
**Baseline.** The baseline phase consisted of only three sessions. Although baseline phases are not required for alternating treatments designs, this experiment’s baseline condition was intended to capture a brief snapshot of what the on-task behavior and praise rates were prior to manipulation. More baseline data may have shown different trends in either on-task behavior, teacher’s praise statements, or both. Future research should consider a longer baseline phase in order to capture a larger picture of the on-task behavior of the participants as well as the teacher’s baseline rate of praise.

**Treatment integrity.** The teacher was able to consistently achieve 1 and 4 praise statements per min in those respective conditions, but fell short in the 8 per min condition. Although the MotivAider® prompted her to provide praise 8 times per minute, the teacher’s mean rate of praise during this condition was actually 7.06 praise statements (range, 6.6 to 7.5). However, research has shown that interventions can still be effective even though treatment integrity and/or implementation fidelity are not 100% (DiGennaro Reed, Reed, Baez, & Maguire, 2011; Pence & St. Peter, 2015).

The teacher’s report that 4 praise statements per min was the most feasible to implement is consistent with the treatment integrity data. Future research should attempt to increase treatment integrity by identifying praise rates that are more easily attainable.

**IOA.** One of the quality indicators of single subject research design identified by Horner et al. (2005) is a minimal standard of 80% IOA for each dependent variable. In this study, mean IOA for on-task behavior in baseline was below the minimal standard at 74%. Although mean IOA for intervention exceeded the minimal standard at 87%, future research should attempt to achieve higher even percentages of IOA in
intervention. It should be noted that this level of agreement is consistent with other studies examining on-task behavior (e.g., Pisacreta et al., 2011; Myers et al., 2011). IOA may be relatively low for this dependent variable in general because on- and off-task behaviors can be difficult to clearly identify; some are subtle and easy to miss. For example, one student placed his head down on his desk, but he was still oriented towards the teacher. One observer may have scored him as still being on-task, while another scored him as being off-task. Another possible explanation for low IOA is the fact that primary data were recorded in real time while a secondary observer scored IOA later by watching a video. The secondary observer may not have been able to see some subtle behaviors on video that the primary observer observed in the classroom. Future research should attempt to achieve higher percentages of IOA, possibly by have both primary and secondary observers score in real time or later on by watching videos.

**Ceiling effects.** Two of the 5 participants demonstrated ceiling effects so it was not possible to determine differential effects of praise rates on their on-task behavior. Austin and Baer were both on task for nearly 100% of intervals during all phases and sessions. Future research should investigate varying praise rates of students who may engage in more frequent off-task and challenging behaviors. Perhaps future research could also examine individualized praise rates for students depending on their baseline levels of off-task behavior.

**Possible Carryover Effects.** Although the randomization of the conditions may have controlled for sequence and treatment effects, it is possible there were carryover effects. Alternating the 4 per min and 8 per min conditions could have served as
intermittent schedules of reinforcement and therefore serving as more powerful reinforcement than if the phases had been continuous. Future researchers should consider using multiple classrooms with different orders of the PRM schedule. Moreover, they could use a variation of a reversal design to run the same rate for a number of days in a row. For example, each phase could last a week as follows: start off by running a baseline condition, then 1 per min, then 4 per min, then 8 per min. Revert back to baseline and then implement the three conditions in a different order. This design would take longer to implement, but would reduce the possibility of carryover effects.

Reprimands. Another limitation is the fact that this study did not track reprimands. Although it is important to determine an optimum rate or guideline for praise, it is also important to examine praise-to-reprimand ratios. As stated in the introduction, current recommendations are a 4:1 of praise-to-corrective feedback. Future research should either track teacher’s free operant reprimands or control and manipulate her rate of reprimands, and subsequently the ratio of praise-to-reprimands.

Quality of praise. This study only tracked rates of specific praise, not the quality of the praise statements. It is possible that lower rates of high quality praise may function as a stronger reinforcer than higher rates of low quality praise. To address this limitation, future studies should also examine the quality of delivered praise statements.

External validity. In this study, the effects of varying schedules of teacher delivered praise statements was used during reading instruction with a small group of second to fourth graders with autism. The results of this study indicate 4 per minute was
the most feasible for maintaining on-task behavior and more than 4 per minute produced even higher percentages of on-task behavior. However, the optimum praise rates may be different for different populations in different settings. Future research should investigate the effects of various praise rates for students from preschool to adult, with different disabilities (e.g., learning disabilities, ADHD, intellectual disability), and in different settings (e.g., public elementary schools).

**Implications for Practitioners**

Decades of research have demonstrated teacher praise is an effective and low cost reinforcer for increasing desired behavior and decreasing challenging behavior across a wide range learners (e.g., Hall et al., 1971; Brophy, 1981; Noell et al., 2005; Pisacreta et al., 2011). Special education teachers and behavior analysts have long understood the power of praise for behavior change, but no published research to date has examined exactly how much praise is needed to be an effective proactive classroom and behavior manager. It is likely that different populations of students in different settings may require different praise rates based on their individual needs. Based on the results of this study, we recommend practitioners examine their current rate of praise during instruction and attempt to identify optimum praise rates that result in the greatest benefit for their students.

In busy classrooms, it may be difficult for teachers to remember to praise students as frequently as needed. For this reason, we recommend teachers implement a self-management system for delivering praise. In this study, the MotivAider® served as a prompt for the teacher deliver a specific schedule of praise statements. Teachers could
use a MotivAider® or any other electronic visual or auditory self-prompting device. Teachers could even set goals for increasing their praise rates, self-graph, and self-reinforce for reaching their pre-set praise goals. Frequent use of contingent and specific praise can be powerful proactive behavior management tool across a wide range of learners and settings.

In this study, the teacher reported via the social validity questionnaire that one reason she preferred the four per minute praise rate was because it was similar to her current rate of praise. However, her praise rate during baseline was 1.38 praise statements per minute. This type of discrepancy can result in overestimating how much praise practitioners or teachers are actually delivering. To address this issue, practitioners should engage in some sort of self-monitoring procedure such as recording each time they deliver a praise statement and monitor their praise rates diligently.

Conclusion

The purpose of this study was to begin establishing the foundation supports suggested praise rates for educators and create a starting point for extending and expanding the praise rate literature from training to actual evidence for why teachers are trained to use certain rates as opposed to others. Once a general, consummate praise rate has been established, ratios of praise-to-corrective feedback can undergo the same examinations.
References


Appendix A: Data Sheet

Date:  
Phase:  
0  On-task  
0  Off-task  

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Appendix B: Social Validity Questionnaire and Responses

Question 1: How many years of teaching experience do you have?
Teacher Response: 1

Question 2: Which praise rate per minute did you feel was the easiest to implement and why?
Teacher Response: Four per minute. It was the most typical/similar rate of praise that I typically use. It also allowed me to praise and reinforce more occurrences of desirable behavior.

Question 3: Which praise rate per minute did you feel was the hardest to implement and why?
Teacher Response: One per minute. If a behavior that I wanted to reinforce occurred during a one per minute day, I couldn’t because I needed to stick to that praise rate. Lots of desirable behaviors occurred and I felt I could not shape and reinforce them when I wanted to.

Question 4: Which praise rate per minute did you feel resulted in your students being on-task the most? What about the least?
Teacher Response: It depends on the student. Overall, I would say four per minute. It also depended on establishing operations that were in place or if we were working for a special reinforcer that day (e.g., “Santa’s Workshop”). I definitely can say one per minute resulted in the students being on-task the least. There were a lot of times the students would point out that they were following directions, but did not receive praise for it (e.g., “What about me? I’m sitting in my seat too?”)

Question 5: Do you think you will now use an increased rate of praise following this study?
Teacher response: Absolutely! I can report that I have already found that I have been using more specific praise outside of the study’s observations. My rate of specific praise is definitely close to four per min.

Question 6: What were some of the biggest challenges or concerns you had about the manipulation of your praise rate?
Teacher Response: Again, with one per minute I couldn’t target or praise specific behaviors that I otherwise would have been able to. With eight per minute, it was hard to find different behaviors to praise or reinforce every seven seconds. It was also hard to target individual kid’s every time if they were all doing what they were supposed to be doing.