AN ANALYSIS OF TEACHERS' USE OF PRAISE AND REPRIMANDS IN RELATION TO STUDENT BEHAVIOR

By

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CHAPTER I

INTRODUCTION

For over thirty years, researchers have examined teachers' interactions with their students in classroom and school settings. Numerous published studies provide insight on teachers' use of approval and disapproval during interactions with their students. First, researchers have described patterns of overall rates of approval and disapproval directed toward classrooms as a whole (typically in general education or inclusive classrooms), with recent increases in approval compared to disapproval (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Heller & White, 1975; Nafpaktitis, Mayer, & Butterworth, 1985; Thomas, Presland, Grant, & Glynn, 1978; Wheldall, Houghton, & Merrett, 1989; White, 1975; Winter, 1990). Results from additional school-based observational research describe teachers' delivery of approval and disapproval for students who have been identified to exhibit problem behaviors (Graden, Thurlow, & Ysseldyke, 1983; Lago-DeLello, 1998; Russell & Lin, 1977; Van Acker, Grant, & Henry, 1996; Wehby, Symons, & Shores, 1995).

Results indicate teacher approval and disapproval are correlated with students' appropriate engagement in classroom activities (Swinson & Harrop, 2001; Nafpaktitis, et al., 1985; Merrett & Wheldall, 1987; Thomas, et al., 1978; Wheldall, et al., 1989; Winter, 1990). Further, results from sequential analyses reveal associations between teachers' approving or disapproving responses following particular student behaviors (Gunter, Jack, Gunter, DeBreire, & Wehby, 1993; McKercher & Thompson, 2004; Ndoro, Hanley,

Tiger, & Heal, 2006; Nelson & Roberts, 2000; Strain, Lambert, Kerr, Stagg, & Lenkner, 1983; Van Acker et al., 1996; VanDerHeyden, Witt, & Gatti, 2001). Across studies, teacher approval is characterized as positive feedback directed toward a student or to a group of students (e.g., praise statement) that is verbal, or both verbal and nonverbal. Teacher disapproval is characterized as negative feedback (e.g., reprimand) directed toward a student or to a group of students that is verbal, or both verbal and nonverbal.

Overall Rates of Approval and Disapproval in General Education Classrooms

In 1975, White reported results from what is regarded as the first published examination of naturally occurring rates of teachers' approval and disapproval during classroom interactions (Beaman & Wheldall, 2000). White reported data from 16 classroom-based observational studies examining rates of teachers' approval and disapproval statements in response to their students' academic and social behavior. In these studies, researchers observed 104 first through twelfth grade teachers as they interacted with their students. Summaries from these 16 studies indicated variability in mean rates of teacher verbal approval and disapproval across studies, with rates of approval ranging from .06 per minute to 1.3 per minute and rates of disapproval ranging from .13 to .89 per minute. In general, however, results indicated that teachers' rates of disapproval statements exceeded their rates of approval statements, particularly past the second grade. Results from three of the four studies conducted in first and second grade classrooms revealed that teachers delivered higher rates of approval statements than disapproval statements. In each of the remaining twelve studies conducted in third grade through twelfth grade classrooms, mean rates of disapproval were higher than mean rates

of approval. Across studies, teachers' approval statements occurred most often in response to their students' academic behavior while disapproval statements occurred most often in response to students' social behavior.

Similar patterns of naturally occurring teacher approval and disapproval were reported in subsequent studies published in the 1970s. Heller and White (1975) observed significantly higher rates of disapproval statements (mean of .52 per minute) than approval statements (mean of .29 per minute) for 10 seventh through ninth grade teachers. Additionally, Thomas, et al. (1978) observed higher rates of verbal disapproval contingent upon students' off-task behavior (mean rate of .58 per minute) than verbal approval contingent upon on-task behavior (mean rate of .20 per minute) for 10 teachers in seventh grade classrooms in New Zealand. Only one teacher exhibited a higher rate of approval than disapproval statements. Heller and White measured teachers' approval and disapproval statements directed to the classroom as a whole while Thomas et al. measured teachers' approval and disapproval statements directed toward a sample of students from each classroom.

Recent trends in overall rates of approval and disapproval. In contrast to earlier studies, results from observational studies published in the 1980s and beyond indicate a general changing trend in teachers' use of approval and disapproval during classroom interactions (Beaman and Wheldall, 2000). For example, Nafpaktitis, et al. (1985) reported higher rates of naturally occurring teacher approval than disapproval directed toward students sampled from 29 sixth through seventh grade general education classrooms in a Los Angeles, CA school district. Summative data revealed a mean rate of disapproval of .29 per minute, much lower than reported in previous studies in similar

classrooms. The mean rate of teachers' appropriate approval (i.e., following students' on-task behavior) was .90. These teachers also delivered a high rate of inappropriate approval (i.e., following students' off-task behavior), with a mean of rate .40 inappropriate approval behaviors per minute. Inspection of means and standard deviations revealed variable frequencies of teachers' approval and disapproval responses. In this study, approval and disapproval behaviors included verbal statements, gestures, and actions indicating approval or disapproval of student behavior.

Similar trends in higher overall rates of naturally occurring teacher approval than disapproval have been observed in classrooms outside of the United States. In three studies published in the late 1980s and later (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Wheldall, et al., 1989), authors reported higher rates of approval than disapproval in British elementary (Harrop & Swinson, 2000; Merrit & Wheldall, 1987) and secondary school (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Wheldall, et al., 1989) classrooms. Across the three studies, mean rates of teacher approval ranged from .65 to 1.30 per minute. Mean rates of disapproval ranged from .53 to .93 per minute, with rates of approval exceeding rates of disapproval in all three studies. Winter (1990) reported a greater percentage of teacher approval responses to student behavior than their disapproval responses to student behavior for teachers in secondary classrooms in Hong Kong.

In each of these studies conducted outside of the United States (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Wheldall, et al., 1989; Winter, 1990), researchers used the OPTIC (Observing Pupils and Teachers in Classrooms; Merrett & Wheldall, 1986) observation system to measure teachers' verbal and non-verbal approval

and disapproval directed toward the class as a whole and to estimate the on-task behavior of the classroom as a whole. Results of these studies indicate that the majority of teacher approval was delivered in response to students' academic behavior while the majority of teacher disapproval was delivered in response to students' social behavior (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Wheldall, et al., 1989; Winter, 1990). Inspection of means and standard deviations revealed potential variability in frequencies and rates of teachers' approval and disapproval responses across teachers observed (Merrit & Wheldall, 1987; Wheldall, et al., 1989; Winter, 1990). There was no mention of level of academic or behavioral functioning for students in any of these studies; presumably these studies were conducted in general education classroom settings.

Approval and Disapproval for Students with Problem Behaviors

Despite general trends toward higher rates of approval and lower rates of disapproval directed to classrooms as a whole in recent years, student-centered classroom observations indicate that students who were identified to exhibit problem behaviors consistently receive high amounts of negative attention and disapproval from their teachers (Graden, et al., 1983; Lago-DeLello, 1998; Russell & Lin, 1977; Van Acker, et al., 1996; Wehby, et al., 1995). For example, in an Australian study published in 1977, Russell and Lin examined one seventh grade teacher's interactions with students identified to be the 10 worst behaved and the 10 best behaved students in the class. When compared to students in the best behaved group, students who were identified to be the worst behaved received significantly more attention (both positive and negative verbal and nonverbal responses), with negative responses being significantly higher than

positive responses. The students rated as having poor classroom behavior exhibited more inappropriate behaviors such as gross motor behaviors, disturbance of others' property, and verbalizations.

Graden et al. (1983) reported similar differences in the way a sample of 10 third and fourth grade teachers responded to students identified as exhibiting problem behaviors. On average, teachers in this study spent significantly more time engaging in disapproval responses directed toward students who were rated by their teachers to have low behavioral competence when compared to their disapproval responses to students with moderate and high behavioral competence. Teachers' delivery of approval was not significantly different across level of behavioral competence. Standard deviations were not included in summative data for either of these two studies (Graden; Russell & Lin, 1977); conclusions about the variability of teacher responses across teachers cannot be inferred.

In subsequent classroom observational studies, researchers examined further teachers' approval and disapproval directed toward students with different levels of risk for emotional or behavioral difficulties (Lago-DeLello, 1998; Van Acker, et al., 1996; Wehby, et al., 1995). Lago-DeLello conducted student-centered observations in 26 first and second grade general education classrooms to compare teachers' interactions with students at risk for emotional disturbance and students not at risk for emotional disturbance. Students identified to be at risk for emotional disturbance received significantly more negative and neutral verbal feedback from their teachers, and these students spent significantly less time academically engaged. The two groups did not differ in the amount of positive feedback statements received from their teachers.

Similar results were reported by Van Acker et al. (1996). These researchers conducted observations in 25 second through fifth grade classrooms and analyzed teachers' rates of verbal and nonverbal praise and reprimands directed toward 102 students identified to be at moderate risk for aggression and 104 students identified to be at high risk for aggression. Students from both risk groups received similarly low rates of praise from their teachers (rounded to .02 per minute for both groups). Although both groups received relatively low rates of reprimands, the high risk group received significantly higher rates of reprimands from their teachers (.07 per minute) than did the mid-risk group (rounded up to a mean rate of .05 per minute). Students at the highest risk for aggression exhibited higher rates of negative behaviors and non-compliance. Inspection of means and standard deviations of rates of feedback received by students in the Lago-DeLello (1998) study indicates potentially high variability in the data, particularly for teachers' negative feedback (where standard deviations were larger than the means for both the at-risk and the not-at-risk groups). Van Acker et al. did not include standard deviations associated with mean rates of teacher praise and reprimands.

Wehby et al. (1995) observed similarly low rates of both praise and disapproval in 28 self-contained elementary and middle school classrooms for students with emotional and behavioral disorders. Researchers conducted detailed, student-centered direct observations of teachers' interactions with students rated to either exhibit high levels of aggressive behavior or low levels of aggressive behavior. In accordance with findings reported by Van Acker et al. (1996), Wehby et al. observed low rates of teacher praise for both groups of students (rate .04 praise per minute for high aggressors and .02 per minute for low aggressors) that were not significantly different. Wehby et al. reported low and

similar rates of disapproval for both groups (.01 per minute for high aggressors and .02 for low aggressors). These detailed observations did reveal, however, that students rated to be highly aggressive received significantly more statements regarding consequences of their problem behavior. Summative data revealed both low means for each of these teacher behaviors and similarly small standard deviations.

Correlations between Approval or Disapproval and Student Engagement

Researchers have examined the relation between teacher approval or disapproval and students' overall levels of engagement classroom activities. For example, overall rates of both approval and disapproval have been correlated with students' overall on-task behavior (Swinson & Harrop, 2001; Nafpaktitis, et al., 1985; Merrett & Wheldall, 1987; Thomas, et al., 1978; Wheldall, et al., 1989; Winter, 1990). In general, higher rates of approval are associated with greater student engagement and higher rates of disapproval are associated with less student engagement of the classroom as a whole (Nafpaktitis, et al., 1985; Thomas, et al., 1978; Wheldall, et al., 1989; Winter, 1990). There is some evidence of stronger correlations between disapproval and on-task behavior than between approval and on-task behavior (Merrett & Wheldall, 1987; Nafpaktitis, et al., 1985). Moreover, Thomas et al. (1978) suggested inconsistencies in the relation between student engagement and teachers' delivery of approval or disapproval across classrooms.

Swinson and Harrop (2001) examined these correlations for a sample of 10 elementary and 10 middle school teachers in British schools. For this sample, rates of teacher approval were positively correlated with the on-task behavior of their classroom as a whole in both elementary and middle school classrooms, with a correlation

coefficient of .63 for elementary school classrooms (statistically significant correlation) and .41 (nonsignificant) for middle school classrooms. Though the data were limited by sample size, inspection of scattergrams of on-task behavior by teacher approval indicated a generally linear relation with higher levels of approval associated with higher levels of on-task behavior.

In contrast to previous findings, Swinson and Harrop (2001) reported *positive* correlations between teacher rates of disapproval and classroom on-task behavior for this sample of teachers. Small, positive correlations were reported for both elementary (correlation of .35) and middle school (correlation of .20) classrooms, though these correlations were not statistically significant. The authors again presented scattergrams of student on-task behavior by rates of teacher disapproval. As posited by the authors, the relation between on-task behavior and rates of disapproval appeared to represent a curvilinear (parabolic) relation for this sample of teachers. The highest levels of on-task behavior were associated with mid-level rates of disapproval whereas lower levels of on-task behavior appeared to be associated with both the low- and high-rates of overall disapproval. These findings, however, may be influenced by a small sample size and the potential nonlinear relation between disapproval and on-task behavior. The authors did not test the hypothesized curvilinear relation between disapproval and students' on-task behavior. Swinson and Harrop (2001) postulated that the observed curvilinear relation between rates of teacher disapproval and student on-task behavior provides evidence for an "optimum level of disapproval" and that "both too little and too much disapproval can be counterproductive" (p.164). This hypothesis has not been examined further.

Though limited and inconsistent, evidence suggests that rates of *disapproval* may be most relevant in describing students' classroom engagement because on-task behavior has been more strongly associated with disapproval than approval (e.g., Merrett & Wheldall, 1987; Nafpaktitis, et al., 1985). The relevance of rates of disapproval as a focus of inquiry is supported further by evidence suggesting a curvilinear relation between rates of teacher disapproval directed toward students in their classroom and overall levels of classroom engagement (Swinson & Harrop, 2001). These correlations all represent relations between summative teacher behavior and student on-task behavior aggregated across classrooms. Correlations between rates of approval or disapproval and student engagement have not been examined within a sample of target students. Correlations between teacher disapproval and students' on-task behavior have not been examined directly in samples of students with problem behavior. Nonetheless, results reported by Lago-DeLello (1998) suggest differences in level of teacher disapproval may be related to level of student engagement for students at risk for emotional disturbance.

In sum, results from existing classroom-based observational studies indicate somewhat inconsistent findings. Studies examining naturally occurring rates of teacher approval and disapproval directed toward either the classroom as a whole or to a group of target students sampled from classrooms reveal a recent trend toward increased overall rates of approval when compared to overall rates of disapproval (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Nafpaktitis, et al., 1985; Wheldall, et al., 1989; Winter, 1990). Results from classroom observations suggest potential variability in overall rates of approval and disapproval across teachers (Merrit & Wheldall, 1987; Nafpaktitis, et al., 1985; Wheldall, et al., 1989; Winter, 1990). Evidence also suggests that teachers' overall

rates of approval and disapproval are correlated with students engagement (at least at a classroom level) (Nafpaktitis, et al., 1985; Merrett & Wheldall, 1987; Wheldall, et al., 1989), with preliminary evidence of a parabolic, curvilinear relation between reprimands and on-task behavior (Swinson and Harrop, 2001).

In contrast, students with the greatest risk for problem behavior generally receive more negative teacher feedback and disapproval when compared to their peers who are at lower levels of risk (Graden, et al., 1983; Lago-DeLello, 1998; Russell & Lin, 1977; Van Acker, et al., 1996; Wehby, et al., 1995). For students at the greatest risk for problem behaviors, reported mean rates of praise ranged from .02 to .04 per minute and mean rates of reprimands ranged from .01 to .07 per minute (Van Acker, et al., 1996; Wehby, et al., 1995). Conversions to rates per hour indicate these students received teacher praise at a range of 1.2 to 2.4 per hour and teacher reprimands at a range of .60 to 4.2 per hour. In general, students with the greatest risk for problem behaviors did not receive levels of approval or praise that was significantly different from comparison groups (Graden, et al., 1983; Lago-DeLello, 1998; Van Acker, et al., 1996; Wehby, et al., 1995). Further, though not directly examined, results from classroom observations suggest students receive potentially variable amounts of teacher approval and disapproval within (Lago-DeLello, 1998) and across classrooms (Merrit & Wheldall, 1987; Nafpaktitis, et al., 1985; Thomas et al., 1978; Wheldall, et al., 1989; Winter, 1990).

Temporal Relations between Teacher Approval and Disapproval and Student Behavior

Results from classroom-based observations provide insight into teachers' use of approval and disapproval in sequential responses to student behavior. In particular, researchers have begun to examine the temporal associations between (a) student behavior and (b) subsequent delivery of either approval or disapproval contingent upon student behavior. For example, Van Acker et al. (1996) used lag sequential analysis to calculate conditional probabilities of teachers' delivery of verbal or gestural reprimands or praise following specific student behaviors in elementary school settings. For students identified as being at moderate risk for aggression, students' correct academic responding was significantly associated (i.e., predicted to occur above chance levels) with the subsequent occurrence of teacher praise. However, for students identified as being at high risk for aggression, correct academic responding was not significantly associated with subsequent delivery of teacher praise. For both groups, students' aggressive and negative behaviors were significantly associated with the subsequent delivery of teacher reprimands. Gunter, et al. (1993) also reported that students' appropriate behaviors were rarely followed by positive social consequences for both aggressive and nonaggressive students in general education (20 students) and self-contained special education classrooms (18 students).

In two studies, researchers examined teacher approval and disapproval responses following students' compliance to commands or instructions (Ndoro, et al., 2006; Strain, et al., 1983) Strain et al. (1983) examined the probability of receiving teacher approval or disapproval following compliance to commands or requests in 19 kindergarten through third grade classrooms for students rated to have low behavioral competence (55

students) and students rated to have high behavioral competence (75 students). The probability of receiving approval or positive social consequences following compliance was low and similar across groups; however, students with low behavioral competence were more likely to receive negative feedback following non-compliance when compared to students with high behavioral competence. In addition, students in the low behavioral competence group were more likely to receive positive social attention from their teachers following non-compliance (i.e., inappropriate approval). Ndoro et al. (2006) also reported a high probability of receiving teacher attention following student noncompliance to teacher instructions in an inclusive preschool classroom. It is important to note that escape from or avoidance of demands frequently followed occurrences of student noncompliance.

In additional studies, researchers examined the associations between students' disruptive behavior and the subsequent teacher responses to disruptive behavior (McKercher & Thompson, 2004; Nelson & Roberts, 2000; VanDerHeyden, et al., 2001). Nelson and Roberts (2000) examined the ongoing teacher-student interactions surrounding disruptive behavior in first through eighth grade general education classrooms. Lag sequential analyses were conducted following student-centered classroom observations of 99 target students who were identified as exhibiting high rates of disruptive or externalizing behaviors and 278 students who served as a comparison group. In general, following the occurrence of student disruptive behavior, teachers were more likely to reprimand target students and to give commands or redirections to students in the comparison group. Students in the comparison group most often terminated

disruptive behavior following the initial teacher command, but target students typically responded to teacher reprimands with more negative behavior.

VanDerHeyden et al. (2001) and McKercher and Thompson (2004) used functional assessment methods to identify potential teacher responses that reinforce or maintain students' problem behavior. Conditional probabilities were calculated for teacher responses following the occurrence of students' problem behavior. First, conditional probabilities indicated that the most prevalent consequence of disruptive behavior of the class as a whole was attention from teachers (not specified as positive or negative attention) for two early childhood classrooms (VanDerheyden, et al.). The probability of receiving attention following disruptive behavior was greater than the probability of receiving attention following appropriate behavior for both classrooms. Additionally, McKerchar and Thompson (2004) reported attention from teachers (unspecified) as the most prevalent consequence following the disruptive behavior of a sample of 14 children in an inclusive preschool setting. The probability of attention following disruptive behavior was only slightly higher than the probability of escaping or avoiding activities.

In general, results from these sequential analyses reveal that students' appropriate behavior is rarely followed by approval from their teachers (Gunter, et al., 1993; Strain, et al., 1983; Van Acker, et al., 1996). Additionally, students are likely to receive attention (reprimands, unspecified attention, or positive social consequences) following the occurrence of problem behaviors (McKercher & Thompson, 2004; Ndoro, et al., 2006; VanDerHeyden, et al., 2001). This pattern is particularly true for students rated as having low behavioral competence (Nelson & Roberts, 2000; Strain, et al., 1983), who are more

likely than their peers to continue engaging in negative interactions with their teachers following disruptive behaviors (Nelson & Roberts, 2000). This evidence from sequential analyses of teacher responses to student behavior suggests that many problem behaviors are potentially reinforced and maintained by teacher attention (i.e., students are hypothesized to engage in problem behaviors in an attempt to access attention from their teachers). Importantly, results from functional assessments further suggest that many students' problem behaviors may be reinforced and maintained by teachers allowing them to escape or avoid classroom tasks, demands, or interactions (Ndoro, et al., 2006; McKercher & Thompson, 2004).

In each of the published studies examining the sequential associations between student behavior and the subsequent occurrence of teacher responses, researchers reported conditional probabilities of teacher responses following student behaviors. In sequential analyses, conditional probabilities represent the probability of a particular response occurring following a particular behavior of interest. For example, researchers often reported the probability of teacher reprimands given the occurrence of student problem behavior. In these studies, researchers reported summative data to describe the general conditional probabilities of teacher approval or disapproval for a sample or subsample of students. Potential for significant variability of sequential associations between teacher responses to student behavior has not been examined; however, it is likely that sequential associations varied from student to student. Further, no studies included analyses of potential relations between these sequential associations between student engagement and overall levels of either approval or disapproval received by each student.

Summary and Limitations to Existing Research Base

Recent trends indicate higher overall rates of teacher approval and lower overall rates of disapproval given to typical classrooms as a whole. In contrast, students identified to exhibit problem behaviors generally receive greater amounts of disapproval from their teachers in both general education and special education classroom settings. Though not directly examined, there is likely significant variability in the rates of approval and disapproval students receive from their teachers. Although researchers have examined teacher approval and disapproval for students with problem behaviors in both general education classrooms and self-contained special education classrooms, no large-scale studies have been conducted to examine directly teacher approval and disapproval across these educational settings.

Overall rates of teacher approval and disapproval delivered to the class as a whole have also been correlated with summative levels of student engagement. At present, little is known about the potential correlation between the amount of approval or disapproval individual students receive and their level of appropriate engagement. Correlations between approval or disapproval and student engagement have not been examined for students identified to exhibit problem behaviors. Further, although Swinson and Harrop (2001) observed a parabolic, curvilinear relation between teachers' rates of disapproval directed toward classrooms as a whole and classrooms' on-task behavior, this relation has not been examined with a larger sample of students.

Results from sequential analyses indicate teachers are more likely to respond to students' problem behaviors and less likely to respond to students' appropriate behaviors, particularly for students with low behavioral competence. Therefore, it is possible that

many problem student behaviors are reinforced and maintained by attention from their teachers (such as reprimands or inappropriate approval). It is also possible that problem behaviors are often maintained by escape or avoidance of classroom tasks, demands, or interactions.

Further analysis is needed to investigate the roles of teacher approval and disapproval as potential reinforcers for student behavior. No large-scale examinations have been conducted to assess the significance of the temporal associations between student appropriate behavior and teacher approval and student inappropriate behavior and teacher disapproval for students identified as exhibiting problem behaviors or to compare directly these two sequential associations. These associations have not been examined across general and special education classroom settings.

Evidence suggests teacher disapproval potentially reinforces many students' problem behaviors. However, existing research has not examined how potential variability in the likelihood of receiving teacher disapproval following inappropriate behaviors (i.e., the strength of the temporal association between inappropriate behavior and teacher disapproval) may influence the relation between overall rates of disapproval and student engagement. It is predicted that the relation between the overall rates of disapproval received by students and their appropriate student engagement is moderated by the strength of the association between student inappropriate behaviors followed by teacher disapproval.

Purpose

The purpose of this study is to provide detailed analyses of teachers' use of disapproval (reprimands) and approval (praise) in relation to the classroom behavior of elementary-age students who have been identified as exhibiting problem behaviors. Teacher approval and disapproval and student behavior will be examined across educational settings (i.e., students observed in general education classrooms and students observed in special education classrooms). Data from classroom-based observations during instructional activities will be analyzed for the following purposes:

1. Provide summary descriptions of teachers' use of praise and reprimands for this population of students along with summary descriptions of students' engagement and disruptive behaviors across general and special education classroom settings. Summarize ratios of praise received per each reprimand across educational settings.
2. Describe the summary relations between student engagement and teachers' delivery of praise or reprimands across educational settings. (a) Present relations in scattergrams. (b) Report correlation statistics between student engagement and rates of praise or reprimands received from their teachers. (c) Examine the possibility of a curvilinear relation between teachers' delivery of reprimands and student engagement.
3. Drawing from a function-based approach to describing behavior, examine the temporal associations between students' appropriate or inappropriate behaviors and teachers' delivery of praise or reprimands (across general and special education classroom settings). Examine the (a) temporal associations between

student engagement and teacher praise as well as (b) the temporal associations between student inappropriate behavior (non-engagement) and teacher reprimands.

4. Provide a focused examination of the potential influence of temporal associations between student behavior and teacher responses on the relation between teacher reprimands and students' engagement. (a) Specifically, determine whether the *magnitude and direction of the association* of teacher reprimands occurring during students' non-engagement moderate the relation between reprimands and engagement. For example, are students who receive high rates of reprimands but are still relatively engaged those students whose non-engagement frequently followed by teacher reprimands (i.e., strong, positive temporal association between problem behavior and teacher reprimands)? In contrast, are students who receive low rates of reprimands and are rarely engaged likely to have strong, negative temporal associations between their non-engagement and teacher reprimands (i.e., problem behavior rarely results in reprimands)? A scattergram will be used to depict the relation between overall rates of reprimands and student engagement by students with positive, nonsignificant, and negative temporal associations between inappropriate behavior and reprimands. (b) If permitted by the structure of the data, test for a significant interaction between strength of the temporal association between non-engagement and teacher reprimands and overall rates of reprimands when describing level of student engagement. (c) Present similar scattergrams depicting this interaction by educational setting.

CHAPTER II

METHOD

Participants

Participants were selected from a sample of 331 kindergarten through fourth grade students from three metropolitan school districts who participated in a larger study (Vanderbilt Behavior Research Center). A total of 203 these participants were receiving special education emotional or behavioral support services in segregated classrooms. The remaining 128 students were selected for inclusion in the larger study by being at risk for developing emotional or behavioral disorders as rated by their general education classroom teachers on the *Systematic Screening for Behavior Disorders* (Walker & Severson, 1991). Students were recruited for the larger study from 30 elementary schools that housed at least one special education classroom for behavior support services. Participants were selected from 109 classrooms (67 general education and 42 self-contained). No students were recruited from segregated special education schools or from self-contained classrooms that were specifically designated for students with developmental or intellectual disabilities.

All students participating in the larger study were considered for inclusion in the current study. Students who had sufficient direct observation data on primary teacher and student behaviors at the relevant assessment time point were included in this study. A resulting 305 students' data were included in this analysis. Of this sample, 126 students were observed during classroom instructional activities in general education classrooms,

and 179 students were observed in self-contained special education classrooms for students with emotional and behavioral difficulties. A summary of demographic information regarding students' gender, grade, and ethnicity is presented in Table 1. On average, students observed in general education classrooms spent 32.46 (4.37 standard deviation) weekly hours in their general education classrooms, 0.77 (4.11) weekly hours in self-contained special education classrooms, and 1.09 (2.56) weekly hours in special education resource classrooms. On average, students observed in the special education classrooms spent 26.36 (10.70) weekly hours in their self-contained special education classrooms, 6.49 (9.70) weekly hours in general education classrooms, and 0.66 (2.91) weekly hours in resource classrooms. A summary of students' special education status, primary disability, and behavior support services is presented in Table 2.

Table 1

Student Demographic Summary by Educational Placement

	Students in General Education Classrooms (n = 126)		Students in Special Education Classrooms (n = 179)		Total Sample (N = 305)	
	n	%	n	%	n	%
Gender*						
Male	88	69.84 %	145	81.01 %	233	76.39 %
Female	38	30.16 %	34	18.99 %	72	23.61 %
Grade*						
Kindergarten	26	20.63 %	20	11.17 %	46	15.08 %
1st	32	25.40 %	33	18.44 %	65	21.31 %
2nd	38	30.16 %	38	21.23 %	76	24.92 %
3rd	14	11.11 %	53	29.61 %	67	21.97 %
4th	16	12.70 %	35	19.55 %	51	16.72 %
Ethnicity						
White	16	12.70 %	16	12.70 %	43	14.10 %
Black	100	79.37 %	100	79.37 %	241	79.02 %
Hispanic	1	0.79 %	1	0.79 %	4	1.31 %
Other/Missing	9	7.14 %	9	7.14 %	17	5.57 %

Note. * indicates a significant ($p < .05$) chi-squared statistic for test of independent distributions across classroom type.

Table 2

Summary of Students' Special Education Status and Support Services by Educational Placement

	Students in General Education Classrooms (n = 126)		Students in Special Education Classrooms (n = 179)		Total Sample (N = 305)	
	n	%	n	%	n	%
Special Education Status						
Yes	34	67.46 %	179	100.00 %	213	69.84 %
No	85	67.46 %			85	27.87 %
Missing	7	5.56 %			7	2.30 %
Primary Disability						
Emotional Disturbance	1	0.79 %	60	33.52 %	61	20.00 %
Developmental Delay	7	5.56 %	28	15.64 %	35	11.48 %
Learning Disability	13	10.32 %	12	6.70 %	25	8.20 %
Other health imp. (ADHD/ADD)	2	1.59 %	20	11.17 %	22	7.21 %
Speech/lang impaired	6	4.76 %	13	7.26 %	19	6.23 %
Mental Retardation	0	0.00 %	13	7.26 %	13	4.26 %
Other health impaired	2	1.59 %	7	3.91 %	9	2.95 %
Autistic	0	0.00 %	4	2.23 %	4	1.31 %
Hearing impaired	2	1.59 %	0	0.00 %	2	0.66 %
Traumatic brain injury	0	0.00 %	2	1.12 %	2	0.66 %
NA or missing	93	73.81 %	20	11.17 %	113	37.05 %
Behavioral Support Plan						
Yes	21	16.67 %	89	49.72 %	110	36.07 %
No	95	75.40 %	70	39.11 %	165	54.10 %
Missing	10	7.94 %	20	11.17 %	30	9.84 %

Student behavioral and academic characteristics. Descriptive information regarding this sample's academic and behavioral characteristics is presented by educational placement (general education or self-contained special education classroom) in Table 3. Data show differences between the two groups on behavioral ratings (i.e., teachers' responses to rating scales for participating students in their classrooms) and on their academic achievement. A brief summary of behavioral and academic measures and associated findings is presented to provide further descriptive information on students in each educational placement.

Table 3

Classroom Instruction and Student Academic and Behavioral Characteristics by Educational Placement (N = 305)[a]

Measure	Student in General Education Classrooms (n = 126)		Students in Special Education Classrooms (n = 179)	
	M (*SD*)	*Mdn* [Interquartile Spread][b]	*M* (*SD*)	*Mdn* [Interquartile Spread]
TRF[c]				
Internalizing Problems	61.18 (9.84)	62 [55, 68]	62.26 (10.64)	64 [54, 70]
Externalizing Problems*	70.27 (9.36)	69.5 [66, 76]	67.12 (9.55)	68 [60, 74]
Total Problems	69.42 (8.42)	69 [64, 74]	67.01 (9.38)	67 [61, 74]
SSRS[d]				
Social Skills*	80.88 (12.53)	80 [73, 89]	89.73 (13.98)	89 [81, 98]
Problem Behaviors*	120.80 (11.74)	121 [115, 131]	114.04 (14.52)	112 [103, 126]
WJ-III[e]				
Broad Reading*	89.57 (14.36)	90.5 [80.5, 101]	78.09 (16.96)	80 [66, 90]
Broad Math*	94.02 (11.79)	95 [86, 101.5]	85.63 (13.85)	86 [77, 94.5]
Broad Written Language*	93.79 (16.73)	94 [84, 106]	79.10 (17.19)	79 [67, 90]
Instructional Context[f]				
Whole group*	47.81 % (26.30)	48.48 % [27.97, 65.81]	33.79 % (27.51)	27.93 % [9.14, 50.00]
Small group*	19.29 % (21.44)	13.10 % [0, 28.89]	35.71 % (29.79)	27.00 % [9.19, 57.86]
Individual activity	29.77 % (24.51)	27.40 % [9.08, 50.00]	28.98 % (27.65)	24.00 % [0, 50.00]
Down time*	4.57 % (6.09)	2.39 % [0, 6.19]	2.49 % (4.15)	0.58 % [0, 3.36]
Teacher Instructional Talk[f]	42.86 % (13.98)	42.80 % [34.03, 52.78]	43.13 % (15.15)	43.43 % [31.38, 52.86]

Note. [a]Data not available for all students for all measures. [b]Mdn = median, interquartile spread established by values at 25th and 75th percentile. [c]*Teacher Report Form T* scores (higher scores indicate higher problem behavior). [d]*Social Skills Rating System* standard scores (higher scores on the Social Skills scale indicate more appropriate social skills whereas higher scores on the Problem Behaviors scale indicate more problem behaviors. [e]*Woodcock-Johnson III* standard scores. [f]Percent of observed time spent in context or coded behavior. * $p < .05$ on Wilcoxon rank-sum (Mann-Whitney *U*) test.

Behavior ratings. Teachers completed two behavioral rating scales for each participating student in their classrooms: the *Teacher's Report Form* (Achenbach & Rescorla, 2001; *Achenbach System of Empirically Based Assessments*) and the *Social Skills Rating System* (Gresham & Elliot, 1990). General education teachers completed the behavioral rating scales for participating students in their classroom identified as being at risk for behavior disorders. Special education teachers completed rating scales for each participating student receiving special education services in segregated classrooms. The potential for differential teacher responses to student behavioral rating scales across educational placement is beyond the scope of this analysis (e.g., special education teachers' potentially rate student behavior differently than teachers who work with typically developing and behaving students in general education classrooms). Nonetheless, resulting teacher responses were included to describe teachers' ratings of behaviors across general education and special education classroom settings.

Teachers' Report Form. The *Teacher's Report Form* (*TRF*, Achenbach & Rescorla, 2001) used to assess students' adaptive functioning, internalizing and externalizing problems, and total problem behaviors. Only scores for internalizing, externalizing, and total problems were used in this analysis. The problem behaviors scales consisted of 113 items. For each participating student, his or her teacher rated how well descriptions of problem behaviors aligned with the student along a 3-point Likert scale. For each item, a teacher rated whether the description was not true for the student (score of 0), somewhat or sometimes true (score of 1), or very or often true (score of 2). Resulting *T* scores were reported in this analysis. The items were worded negatively, and resulting higher *T* scores indicated higher problem behaviors. Based on a normative

sample, *T* scores below 60 were considered within normal range, *T* scores of 60 to 63 (84th to 90th percentile) were considered in the borderline range, and *T* scores above 63 were considered to be within the clinical range.

For the *Internalizing problem behavior score*, teachers rated student behaviors for anxious or depressed, withdrawn or depressed, and somatic complaints syndromes. The Internalizing problem behavior scale consisted of 26 behavioral descriptions, such as is "Nervous, high-strung, or tense", "Withdrawn, doesn't get involved with others", and exhibits "Physical problems without known medical cause." Of the students in general education classrooms, 9 students (7.14 %) were identified as being within the borderline range for internalizing problem behaviors while 58 (46.03 %) students' scores fell within the clinical range. Similarly, 13 (7.26 %) students in the special education classrooms had scores that fell within the borderline range and 89 (43.37 %) fell within the clinical range. Summative data is presented by educational placement in Table 3. A reported coefficient alpha reliability for Internalizing problem behaviors scale was .90 with a test-retest reliability coefficient of .86.

For the *Externalizing problem behavior score*, teachers rated students' rule-breaking and aggressive behaviors (35 items). Items included, "Breaks school rules", is "Disobedient at school", and "Argues a lot." Seven (5.56 %) students in general education classrooms were in the borderline range, and 96 (48.48 %) were in the clinical range. In contrast, 24 (13.41 %) student scores from special education classrooms fell within the borderline range and 102 students (56.98 %) from these classrooms fell into the clinical range. *T* scores for externalizing problems were higher for students in general education classrooms than for students in special education classrooms, indicating that

teachers in general education classrooms rated the participating students in their classrooms to have more problematic externalizing behaviors when compared to special education teachers' ratings of students in their classrooms (see Table 3). A coefficient alpha reliability of .95 was reported for the Externalizing problem behaviors scale alone with a test-retest reliability coefficient of .89.

The *Total Problems score* (full 113 items) consisted of both the Internalizing and Externalizing problems scores as well as three additional syndromes (social problems, thought problems, and attention problems) and other problem. Similar to ratings for Internalizing and Externalizing scores, a higher percentage of participating students from general education classrooms were rated to be within the clinical range for Total Problems (96 students, 76.19 % within the clinical range and 12 students, 9.52 % within the borderline range). Of the students in the special education classrooms, 105 (58.66 %) student scores fell within the clinical range and 23 (12.85 %) fell within the borderline range. A reported coefficient alpha reliability for the Total Problems scale was .97 with a test-retest reliability coefficient of .95.

Social Skills Rating System. The *Social Skills Rating System* (*SSRS*; Gresham & Elliot, 1990) teacher rating scale consisted of 57 items composing three domains: social skills, problem behaviors, and academic competence. Only scores for social skills and problem behavior scales were used in this analysis. For the social skills and problem behavior domains, teachers were prompted to rate the frequency of particular student behaviors along a 3-point Likert scale. For each item, a teacher rated whether a student demonstrated the behavior never (score of 0), sometimes (score of 1), or very often (score of 2).

For the S*ocial Skills Scale*, teachers rated student behaviors from the subscales of cooperation, assertion, and self-control behaviors. The Social Skills Scale consisted of 30 items, such as “Finishes class assignments within time limits” (cooperation), “Makes friends easily” (assertion), and “Controls temper in conflict situations with peers” (self-control). Standard scores for the Social Skills Scale were used in this analysis where each participant’s score was based on a standardized mean of 100. Scores falling closely to 100 were considered to be near the standardized mean. Scores above the standardized mean (greater than 100) were indicative of more appropriate social skills whereas lower scores were indicative of less appropriate social skills. The average standard score for the social skills scale was higher for students’ in self-contained special education classrooms, indicating higher rated (i.e., more appropriate) social skills (see Table 3). The reported coefficient alpha reliability for the Social Skills Scale was .94 for elementary students, with subscale coefficient alphas of .92 for the cooperation subscale, .86 for the assertion subscale, and .91 for self-control. Test-retest reliability coefficient for the Social Skills Scale was .85 for all forms of the SSRS for elementary students, with subscale reliability coefficients ranging from .75 to .88.

For the *Problem Behaviors Scale*, teachers rated student behaviors included in the subscales externalizing problems, internalizing problems, and hyperactivity. Sample items included, “Gets angry easily” (externalizing problems), “Acts sad or depressed” (internalizing problems), and “Is easily distracted” (hyperactivity). Again, standard scores for the Problem Behaviors Scale were used in this analysis. However, items on this scale were used to assess negative behaviors. Therefore, higher standard scores on the problem behavior scale were indicative of more problem behaviors and lower standard scores

indicated fewer problem behaviors. The average standard score for the problem behavior scale was lower for students' in self-contained special education classrooms, indicating fewer problem behaviors as rated by their teachers (Table 3). The reported coefficient alpha reliability for the Problem Behaviors Scale was .88 for elementary students, with subscale coefficient alphas of .88 for externalizing problems, .78 for internalizing problems, and .87 for hyperactivity. Test-retest reliability coefficient for the Problem Behaviors Scale was .84 for all forms of the SSRS with elementary students, with subscale reliability coefficients ranging from .76 to .83.

Academic achievement. Students' academic achievement was assessed using the *Woodcock-Johnson III Tests of Achievement* (*WJ-III*; Woodcock, McGrew, & Mather, 2001). The test was administered individually by graduate student research assistants. Standard scores (standardized mean of 100) for three clusters were used in this analysis. The *Broad Reading* cluster included the tests Letter-Word Identification, Reading Fluency, and Passage Comprehension (reported median coefficient alpha reliability of .93 for this age range). The *Broad Math* cluster included the tests Calculation, Math Fluency, and Applied Problems (median reliability of .95). The *Broad Written Language* cluster included the tests Spelling, Writing Fluency, and Writing Samples (median reliability of .94). On average, students placed in special education classrooms exhibited lower standard scores on all three academic domains (i.e., broad reading, broad math, and broad written language) when compared to students in general education classrooms (Table 3).

Setting

All data were collected in elementary schools participating in the larger study. Each student was observed in his or her classroom during language arts instructional time. Each student was enrolled in one of two types of educational placements: a general education classroom or a self-contained special education classroom for students who exhibit problem behaviors. Participating students and their teachers were observed in 67 general education classrooms and 42 special education classrooms. A summary of teacher demographic information by classroom type is presented in Table 4. On average, teachers in general education classrooms reported 13.15 years of teaching experience (standard deviation of 11.05, range of 0.25 to 40 years of teaching), with missing data for two teachers. Teachers in special education classrooms reported an average of 13.53 years of teaching experience (standard deviation of 9.36, range 0.25 to 34 years of teaching), with missing data for four teachers. For this analysis, the number of students observed in a particular teacher's classroom ranged from one to five for general education teachers (mean of 1.88 students per teacher with a standard deviation of 1.07). Students observed in each classroom ranged from one to nine for special education teachers (mean of 4.26 students per teacher with a standard deviation of 2.02).

Table 4

Teacher Demographic Summary by Educational Placement

	Teachers in General Education Classrooms (n = 67)		Teachers in Special Education Classrooms (n = 42)		Total Sample (N = 109)	
	n	%	n	%	n	%
Gender						
Male	3	4.48 %	3	7.14 %	6	5.51 %
Female	63	94.03 %	37	88.10 %	100	91.74 %
Missing	1	1.49 %	2	4.76 %	3	2.75 %
Ethnicity*						
White	48	71.64 %	19	45.24 %	67	61.47 %
Black	18	26.87 %	18	42.86 %	36	33.03 %
Hispanic	0	0.00 %	1	2.38 %	1	0.92 %
Other/Missing	1	1.49 %	4	9.52 %	5	4.58 %

Note. * indicates a significant ($p < .05$) chi-squared statistic for test of independent distributions across classroom type.

Characteristics of classroom instruction. The primary focus of this analysis is to describe teachers' use of praise and reprimands in relation to student behavior during instructional interactions that occur in both general education and special education settings. A brief description of characteristics of classroom interactions is needed to provide a better framework for these interactions that occur in both educational settings. As a part of the larger study, researchers observed each student's relevant behaviors during instructional activities in his or her classroom. Simultaneously, researchers observed teachers' interactions with each participating student. Direct observation measures provided information on *instructional contexts* and the amount of *instructional talk* teachers directed toward target students during observations (the observational coding system, training, procedures, and reliability estimates will be described in further detail in the subsequent section). Summaries of these variables are included here to provide a description of characteristics of classroom instruction across general education and special education classrooms.

Instructional contexts. Each participating student was observed during instructional activities in their classroom using real-time, continuous observational system *Multiple Option Observation System for Experimental Studies* (*MOOSES*; Tapp, Wehby, & Ellis, 1995; Tapp & Wehby, 2000). During these observations, researchers used timed event coding to measure durations of students' participation in four types of instructional contexts: whole class instruction, small group instruction, individual activity, and down time. *Whole class instruction* was coded when a target student was involved in an activity with the whole class. *Small group instruction* was coded when a target student was participating in an activity with a few peers. *Individual activity was*

coded when a student was involved in an activity by him or herself. *Down time* was coded when a student had completed the activity or task at hand and was waiting to go on to another activity or transitioning to another activity. Each of these contexts was coded at the onset of the activity. Each of these contexts is reported as the percentage of total observation time (typically, 3600-s total across four 900-s observation sessions) a student participated in the activity or context. On average, students in general education classrooms spent a higher percentage of time participating in whole class instructional contexts, less time participating in small group instruction, and more time in down time when compared to students observed in special education classrooms. These results are summarized in Table 3.

Teachers' instructional talk to target student. *Teacher instructional talk* was coded for verbal statements relating to instructional tasks past, present, and future directed toward the target student or to the group of which the target student is a part. Instructional talk included instructions or other information relevant for the preparation for and completion of instructional tasks as well as a teacher's lectures or explanation of a concept, behavioral evaluations, and commands stated to focus students on the instructional activity. Nonexamples included the teacher not talking to the target student related to instructional tasks. Instructional talk was coded at the onset of instructional talk directed toward the target student and ended when the teacher had stopped talking to the target student for 5-s or when the teacher began talking directly to another adult or student other than the target student. Durations of instructional talk were represented as the percentage of seconds the teacher engaged in instructional talk to target student during the total observation time (see Table 3). A comparison across classroom types did

not indicate a statistically significant difference in percentage of time students received instructional talk from their teachers.

Measures of Primary Interest

Direct observations were conducted for each participating student to measure a number of student behaviors as well as teacher behaviors directed toward each target student. All observations were conducted by trained graduate student research assistants during language arts-related instructional activities occurring within the students' classrooms. Observers recorded behaviors on handheld personal digital assistants using the real-time, continuous observational system *Multiple Option Observation System for Experimental Studies* (*MOOSES*; Tapp, Wehby, & Ellis, 1995; Tapp & Wehby, 2000).

Student behaviors. Student behaviors of primary interest included engagement (and non-engagement) and student disruptive behaviors (negative talk and aggression). Timed event coding was used to measure durations of student engagement and non-engagement as well as frequencies of students' negative talk and aggression.

Student engagement. For each second during an observation session, a student was coded as being engaged when he or she was appropriately engaging in working on assigned/approved activity. Examples of student engagement included (but were not limited to), (a) attending to the material and the task, (b) making appropriate motor responses (e.g., writing, following rules of a game, looking at the teacher or the student speaking), (c) asking for assistance (where appropriate) in an acceptable manner (e.g., raising hand), and (d) waiting appropriately for the teacher to begin or continue with

instruction (e.g., staying in seat). A student was coded as engaged at the onset of appropriate engagement.

In contrast to being engaged, a student was coded as being *not engaged* when he or she was not participating in an assigned or otherwise approved activity. Examples of this behavior included: (a) inappropriately looking around the room, (b) inappropriately out of seat during an instructional activity, (c) disturbing others or unsanctioned talk to others, (d) engaging in an unapproved or unassigned activity, etc. Not engaged was coded after the target student had not been engaged for 5-s. Durations of student engagement and non-engagement were represented as the percentage of seconds the student exhibited the behavior of interest during the total observation time (typically 3600-s in total).

Student disruptive behaviors. Student disruptive behaviors included two frequency behaviors: student negative talk and student aggression. *Student negative talk* was coded for a student's statements or vocalizations made with the intent to provoke annoy, pester, mock, complain, tattle, or make fun of another. Negative talk further included threats of physical aggression against person or property, arguing or disagreeing with another person (as in protest) as well as any verbal refusal to comply with a mand. Occurrences of negative talk were recorded at the onset of behavior, with separate instances coded when at least 5-s passed between the end of one statement and the beginning of the next. Rates of negative talk are represented as events of negative talk per hour (converted from total frequencies observed per total seconds observed).

Student aggression was coded for a student's deliberate physical contact that was potentially harmful to self, others or property and for posturing or a gesture that was intended to provoke another. Examples of aggression included hitting, pushing, kicking,

throwing something at someone else, etc. Nonexamples included swearing at another person, accidentally bumping into another person, and hugging another person. Occurrences of aggression were recorded at the onset behavior, with separate instances coded when at least 5-s passed between the end of one incident and the beginning of the next. Rates of aggression were converted to events of aggression per hour.

Teacher behaviors. Teacher behaviors of primary interest were teacher praise and teacher reprimands. Timed event coding was used to measure frequencies of teacher reprimands and praise. Ratios were calculated as the number of praise received per one reprimand received during the observed time.

Teacher praise. Praise behaviors were coded for verbal statements or gestures directed to the target student (either as an individual or as a member of a group of students) that indicated approval of behavior over and above an evaluation of adequacy or acknowledgement of a correct response to a question. Examples included (a) a reward such as points for appropriate behavior, (b) thumbs up, high five, or a pat on the back, (c) saying, “Good work, Yvonne”, “Everyone is sitting quietly, great”, “Thank you”, etc. Nonexamples included statements that acknowledged a correct response (e.g., “That’s right”) or evaluations that were not over and above adequacy (e.g., “Everyone is sitting quietly.”). Occurrences of praise were coded at the end of a praise statement or gesture, with separate instances coded when at least 5-s passed between the end of one praise behavior and the beginning of the next. Rates of praise were converted to events of praise per minute.

***Teacher reprimands*.** Teacher reprimands were coded for observed verbal comments or gestures made by the teacher directed toward the target student (either as an

individual or in a group) indicating disapproval of the student's social behavior. Statements were coded as reprimands when they were intended to correct student behavior as it is occurring; reprimands did not include precorrection statements or statements of behavioral expectations to prepare for instruction or activities. Reprimands did include statements of redirection by the teacher as well as statements of negative consequences by the teacher. Teacher responses to incorrect academic response (e.g, "this is incorrect") were not coded as reprimands. Occurrences of reprimands were coded at the end of the reprimand statement or gesture, with separate instances coded when at least 5-s passed between the end of one reprimand and the beginning of the next. Rates of reprimands were converted to events of reprimands per minute.

Procedures

Observer training. Graduate student research assistants were trained to measure the behaviors of interest. First, a primary research assistant presented an initial training session on the behavioral codes, including detailed descriptions and criteria for each code. Then, observers practiced measuring the behavioral codes using *MOOSES* (Tapp, Wehby, & Ellis, 1995; Tapp & Wehby, 2000) while observing standard video tapes of similar-aged students interacting with teachers during instructional activities in classrooms and compared their results to master code files. During this phase of observer training, each observer was required to meet a criterion of 80% point-by-point (seconds) agreement with the master code files for all behaviors on each of the four standard video tapes. Observers who met the criterion of 80% agreement on all four standard video tapes then practiced in vivo data collection in nonparticipating elementary classrooms. To

assess interobserver agreement, two observers recoded student and teacher behaviors simultaneously. Again, observers were required to meet a criterion of 80% point-by-point agreement for all behaviors for three consecutive practice observation sessions. Interobserver agreement was calculated using the *MOOSES* program.

Data collection. In this study, data were examined from the first assessment phase of a larger longitudinal study. Direct observations of student and teacher behaviors were conducted for each participating student. For each participating student, research assistants observed and recorded student and teacher behaviors for a target of 4 observation sessions that were each 15-min in length. The desired total observation time for each participant was 60-min (900-s), sampled across 4 days (totaling 3600-s). Mean total observation time was 3486.28-s (with a standard deviation of 277.70). Total observation time ranged from 1800-s (two 900-s observation sessions conducted) to 3600-s (four 900-s observation sessions conducted).

Reliability estimation. To estimate the reliability of the direct observation measures, interobserver agreement was calculated for approximately 20 % of observation sessions. During each reliability session, two observers measured student and teacher behaviors simultaneously. Means and ranges of percentages of point-by-point agreement were: 91 % agreement for praise (ranging from 50 to 100 % agreement), 86 % agreement for reprimands (ranging from 25 to 100 %), 99 % agreement for engagement (ranging from 79 to 100 %), and 99 % agreement for non-engagement (ranging from 80 to 100 % agreement).

Data Analysis

Various graphic and statistical evaluative approaches were used to address the purposes of the study. An alpha level of .05 was used in all tests of statistical significance. Analyses were conducted using the statistical package, *Stata Statistical Software: Release 10* (StataCorp, 2007).

CHAPTER III

RESULTS

Summary Descriptions of Teacher and Student Behaviors

Means (and standard deviations, ranges, and confidence intervals) and medians with interquartile spreads for teachers' use of praise and reprimands, ratios of praise to reprimands received per hour, student engagement, and student disruptive behaviors are summarized by educational placement in Table 5. In Table 5, student engagement is presented as the percentage of time students were observed to be appropriately engaged. Frequency behaviors (teachers' praise and reprimands directed toward target students and students' disruptive behaviors) are presented as rate per hour (converted from total frequencies observed per total seconds observed) and ratios were calculated as the number of praise received per one reprimand received during the observed time. Examination of distributions of all observed behaviors indicated a high degree of variability. Graphic (e.g., examination of histograms with kernel density estimates and stem-and-leaf plots) and numerical (Shapiro-Wilks test for normality and skewness and kurtosis test) methods indicated that these variables were not normally distributed.

Table 5

Summary of Student and Teacher Behaviors by Educational Placement (N = 305)

Measure	*M* (*SD*)	Range	95 % CI[a]	*Mdn* [Interquartile Spread][b]
		Students in General Education Classrooms (n = 126)		
Teacher behaviors				
Praise[c]	7.21 (8.15)	0 to 50.72	[5.77, 8.64]	5.18 [2, 9.66]
Reprimands[c]	8.44 (7.28)	0 to 33	[7.15, 9.72]	6.42 [3, 12.33]
Praise to Reprimands[d]	1.72 (3.74)	0 to 30	[1.03, 2.40]	0.83 [0.23, 1.90]
Student behaviors				
Engagement[e]	83.80 % (12.82)	41.75 % to 100 %	[81.54, 86.07]	86.62 % [78.44, 93.19]
Disruptive behaviors				
Negative talk[c]	2.35 (3.63)	0 to 23.17	[1.71, 2.99]	1 [0, 3.07]
Aggression[c]	0.60 (1.41)	0 to 9	[0.35, .85]	0 [0, 1]
		Students in Special Education Classrooms (n = 179)		
Teacher behaviors				
Praise[c]	11.83 (13.22)	0 to 77.33	[9.88, 13.78]	7 [4, 16]
Reprimands[c]	8.69 (7.22)	0 to 41	[7.62, 9.75]	7.08 [3.23, 11.12]
Praise to Reprimands[d]	2.37 (5.62)	0 to 44	[1.89, 3.57]	1 [0.44, 2.63]
Student behaviors				
Engagement[e]	85.94 % (14.41)	21.69 % to 100 %	[83.81, 88.06]	91.11 % [80.50, 96.83]
Disruptive behaviors				
Negative talk[c]	4.37 (7.51)	0 to 45.51	[3.26, 5.47]	1 [0, 5.12]
Aggression[c]	0.78 (2.43)	0 to 26.42	[0.42, 1.14]	0 [0, 1]

Note. [a]CI = confidence interval. [b]Mdn = median, interquartile spread established by values at 25th and 75th percentile. [c]Rate per hour for behavior. [d]Ratio of praise received to reprimands received per hour. [e]Percent of observed time student was appropriately engaged.

Teacher praise. For this sample, students in general educational classrooms received an average of approximately 7 praise behaviors per hour, and students in special education received an average of 12 praise behaviors per hour. Students whose rates of praise received fell at or above the lowest quartile values of praise were observed to receive two or fewer praise per hour in general education classrooms (38 students, 30.16 %) and four or fewer praise per hour in special education classrooms (52 students, 29.05 %). In general education classrooms, 25 students received one or less than one praise per hour (19.84 %) while 14 students in special education classrooms received one or less than one praise per hour (7.82 %). Eleven (8.73 %) students in general education classrooms and nine students in special education classrooms (5.03 %) received no praise during observations. In contrast, students whose rates of praise received fell at above the highest quartile values were observed to receive from 9.66 to approximately 50 praise per hour in general education classrooms (32 students, 24.40 %) and from 16 to approximately 77 praise per hour in special education classrooms (45 students, 25.14 %).

Teacher reprimands. Students in both classroom settings received an average of approximately 8 reprimands per hour. Students whose rates of reprimands fell at or above the highest quartile values of reprimands were observed to receive from 12.33 to as many as 33 reprimands per hour in general education classrooms (31 students, 24.60 %) and from 11.12 to as many as 41 reprimands per hour in special education classrooms (43 students, 24.02 %). By comparison, students whose rates of reprimands fell at or below the lowest quartile values of reprimands were observed to receive 0 to approximately 3 reprimands per hour in both classroom settings (36 students, 28.57 %, in general

education classrooms with 3 or fewer reprimands and 45 students, 25.14 %, in special education classrooms with 3.23 or fewer reprimands).

Ratios of praise to reprimands. There was a high degree of variability in the ratios of praise to reprimands received by students in both educational settings. In general education classrooms, nine students (7.14 %) were observed to receive no reprimands during observations, but these students received an average of 2.44 praise per hour (*SD* = 2.35, ranging from 0 to 8 praise per hour). In contrast, ten students (7.94 %) observed in general education classrooms received no praise during observations but received an average of 6.25 reprimands per hour (*SD* = 5.72, ranging from 1 to 9.34 reprimands per hour). The remaining 107 students in general education classrooms were observed to receive at least one praise and one reprimand during observations. These 107 students received an average of 1.88 praise statement or gesture for every one reprimand (*SD* = 3.88), but the ratios of praise to reprimands varied from as few as 0.04 praise to one reprimand to as many as 30 praise to one reprimand per hour. Students whose ratios fell at or below the lowest quartile value for praise to reprimand ratios (30 students, 23.81 %) had ratios that ranged from 0 praise per reprimand to 0.23 praise per reprimand. These students (who received at least one praise) received from 4.5 to 17 *reprimands for every one praise* statement or gesture received.

Ratios of praise to reprimands were also variable for students observed in special education classrooms. Six students (3.35 %) received no reprimands at all but received an average of 6.55 praise per hour (*SD* = 3.59, ranging from 4 to 8.27 praise per hour). Nine students (5.03 %) received no praise at all but received an average of 9.58 reprimands per hour (*SD* = 9.48, with ranges from 5 to as many as 31 reprimands per hour). The

remaining 164 students were observed to receive at least one praise and one reprimand at an average ratio of 2.88 praise to one reprimand per hour (*SD* = 5.73, with ratios ranging from .05 praise to one reprimand to as many as 44 praise for one reprimand). Students whose ratios fell at or below the lowest quartile value for praise to reprimand ratios (46 students, 25.70 %) had ratios that ranged from 0 praise per reprimand to 0.44 praise per reprimand. These students (who received at least one praise) received from 2.29 to as many as 21 *reprimands for every one praise* statement or gesture received.

Student engagement. On average, students in both classroom settings were observed to be engaged over 80 % of the time. In fact, 70.63 % (89 students) of students in general education and 75.42 % (135 students) of students in special education classrooms were engaged at least 80 % of observed time. A number of students from both classroom settings were observed to be engaged for less than half of the observed time (i.e., less than 50 % engagement). Specifically, 3.17 % (4 students) of students in general education classroom and 2.79 % (5 students) in special education classrooms were engaged less than half of the observed time.

Student disruptive behavior. In general education classrooms, 42.06 % (53 students) of students were observed to exhibit zero disruptive behaviors whereas the remaining 73 students (57.94 %) exhibited one or more disruptive behaviors. Out of all students observed in general education classrooms, 53.97 % (68 students) of students exhibited negative talk and 57.94 % (73 students) exhibited aggression (28 students, 22.22 %, exhibited at least one aggressive behavior and one negative talk behavior). Students in general education classrooms whose rates of disruptive behaviors fell at or

above the highest quartile values exhibited negative talk behaviors ranging from approximately 3 to 23 per hour and aggression ranging from 1 to 9 per hour.

In special education classrooms, 37.43 % (67 students) of students exhibited no disruptive behaviors during observations whereas the remaining 113 (63.13 %) students exhibited one or more disruptive behaviors. Of the students observed in special education classrooms, 59.22 % (106 students) exhibited negative talk and 63.33 % (113 students) exhibited aggression (40 students, 22.35 %, exhibited at least one negative talk and one aggressive behavior). In special education classrooms, students whose disruptive behaviors fell at or above the highest quartile values exhibited negative talk ranging from approximately 5 per hour to as many as approximately 45 negative talk behaviors per hour aggression ranging from 1 per hour to as many as just over 26 per hour.

Summary Relations between Teacher and Student Behaviors

Graphic and statistical methods were used to examine the relations between (a) student engagement and rates of praise and (b) student engagement and rates of reprimands.

Student engagement and teacher praise. Scatterplots depicting the relation between rates of teacher praise and student engagement is presented by educational placement in Figure 1. As a preliminary examination of the general form of the relation, lowess fit lines (locally weighted scatterplot smoother) are superimposed on the scatterplots to illustrate the best nonparametric fit of the relations between variables. Visual inspection of these scatterplots and lowess fit lines indicate a general positive (i.e., increasing) association between the variable pairs in both educational placements.

Although lowess lines provide an overall summary of the form of the relation between two variables (*X* and *Y*), precision is lower for lowess estimates near the tails of the *X* distribution (e.g., where data points for high rates of praise or reprimands are sparse) (Cohen, Cohen, West, & Aiken, 2003). Reference lines (dashed lines) are included at the medians for each variable. The upper left quadrants, for example, (i.e., students above median for percentage of engagement and below the median for praise received) include students who received the lowest amounts of praise but were still often engaged. In contrast, the lower right quadrants include students who received the highest amounts of praise but were the least engaged.

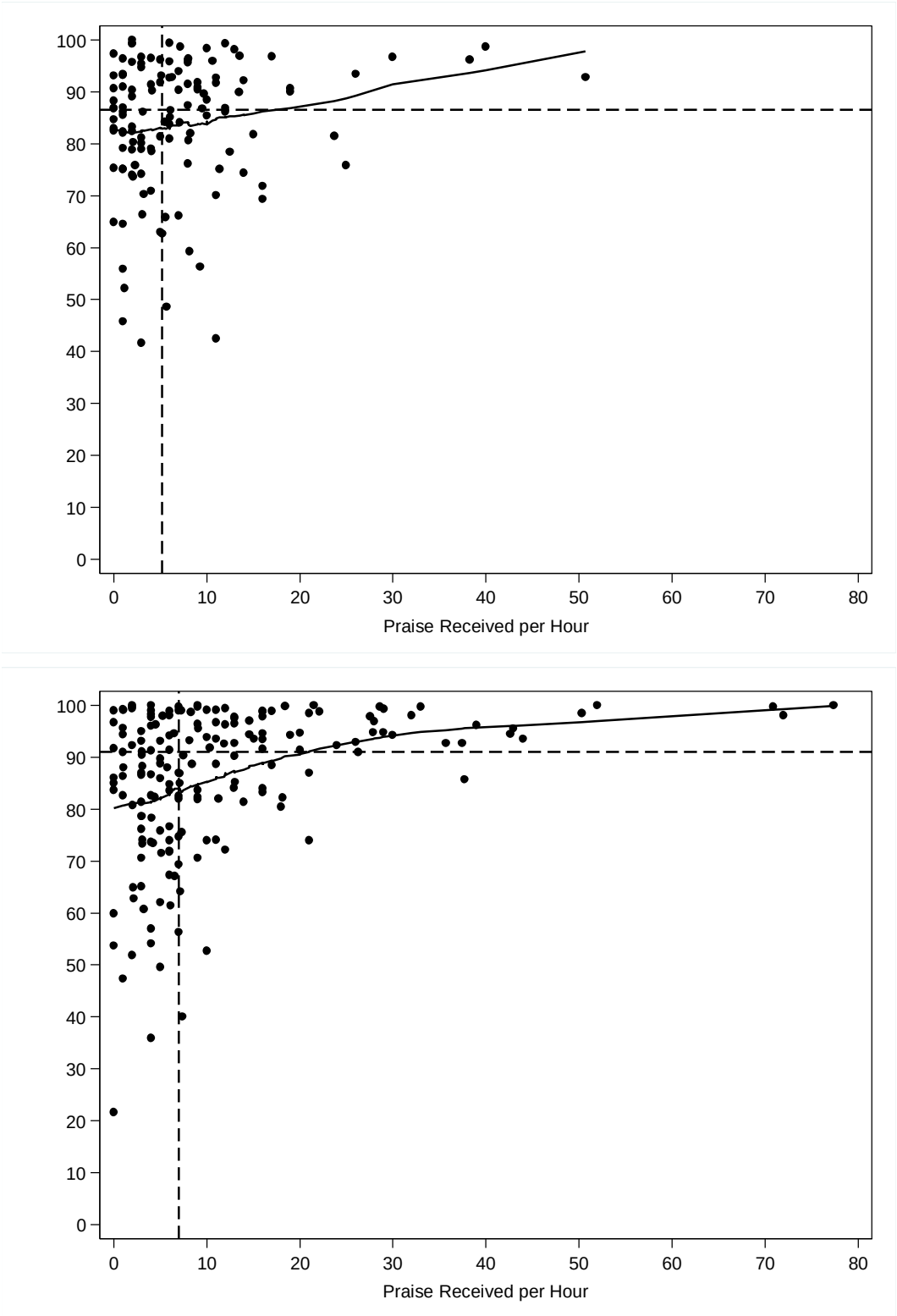

Figure 1. Scatterplots of rates of praise received and student engagement for students in general education classrooms (top, n = 126) and special education classrooms (bottom, n = 179). Lowess fit lines (solid lines) and median lines (dashed lines) included.

Statistical methods were then used to estimate the correlation between student engagement and praise in both educational placements. First, Spearman's rank correlation coefficients (r_S) were calculated as a nonparametric measure of association. This correlation coefficient was selected to address non-normal distribution of variables of primary interest. Correlation coefficients are presented in Table 6. The resulting correlation coefficient of .36 ($p < .001$) for students observed in special education classrooms suggests a moderate (Cohen, 1992) positive association (and a moderate effect size) between student engagement and rates of teacher praise received (i.e., an increase in praise is associated with an increase in engagement). However, the correlation coefficient of .15 (nonsignificant *p*-value of .095) for students in general education classrooms indicates only a small to moderate association (and effect size) between student engagement and praise received in this setting.

Next, to account for correlated data within classrooms (i.e., more than one student observed in a single teacher's classroom), regression analyses (one-way ANOVAs with fixed effects) were conducted using clustered robust standard errors to estimate the linear relations between student engagement and rate of teacher praise for each classroom type. For these analyses, the standard errors were adjusted for the number of clusters (67 and 42 teachers observed in general and special education classrooms, respectively) rather than the number of students observed, and the degrees of freedom for each model were also based on the numbers of clusters.

Results from the regression of percentage of student engagement on rate of praise received (with clustered robust standard errors) indicated a positive association between praise and engagement (regression coefficient for rate of praise per hour $b = .28$, $p =$

.007) for students in general education classrooms, R^2 = .03, $F(1, 66) = 7.75$, $p = .007$, 95% CI [-.05, .11], indicating a positive association (similar to corresponding Spearman's rank correlation). Results from the regression of percentage of student engagement on rate of praise (with clustered robust standard errors) for students observed in special education classrooms also indicated a positive association similar to Spearman's rank correlation results, regression coefficient for rate of praise per hour $b = .38$, $p = <.001$, $R^2 = .12$, $F(1, 41) = 20.78$, $p < .001$, 95% CI [-.06, .29]. Resulting regression coefficients indicate that, on average, an increase in one praise behavior per hour was associated with a 0.28 or a 0.38 increase in percentage of time engaged for students in general and special education classrooms, respectively. Although results from these regression analyses provide further support for positive associations between student engagement and teacher praise in both classroom settings, the tests of significance should be considered with care. Specifically, post-regression graphic and statistical diagnostics for both classroom types indicated violations of the assumptions of normality of residuals and constant variance of residuals, or homoskedasticity. Violations of these assumptions result in unbiased estimates of regression coefficients; however, these violations typically lead to incorrect standard errors (and thus, incorrect significance tests and confidence intervals) (Cohen, et al., 2003).

Student engagement and teacher reprimands. Scatterplots depicting the relation between rate of teacher reprimands and student engagement (with superimposed lowess fit lines and reference lines at each variable's median) is presented by educational placement in Figure 2. Visual inspection of these scatterplots and lowess fit lines indicate a general negative association between the variable pairs in both education placements,

with a potentially curvilinear (U-shaped) relation for students in special education classrooms (bottom scatterplot of Figure 2). The upper right quadrants (i.e., students above medians for percentage of engagement and reprimands received) include students who received the highest amounts of reprimands but were also often engaged. The lower left quadrants include students who were least engaged but also received the fewest amount of reprimands per hour; despite being frequently off-task, teachers gave the fewest reprimands (and redirections) to these students.

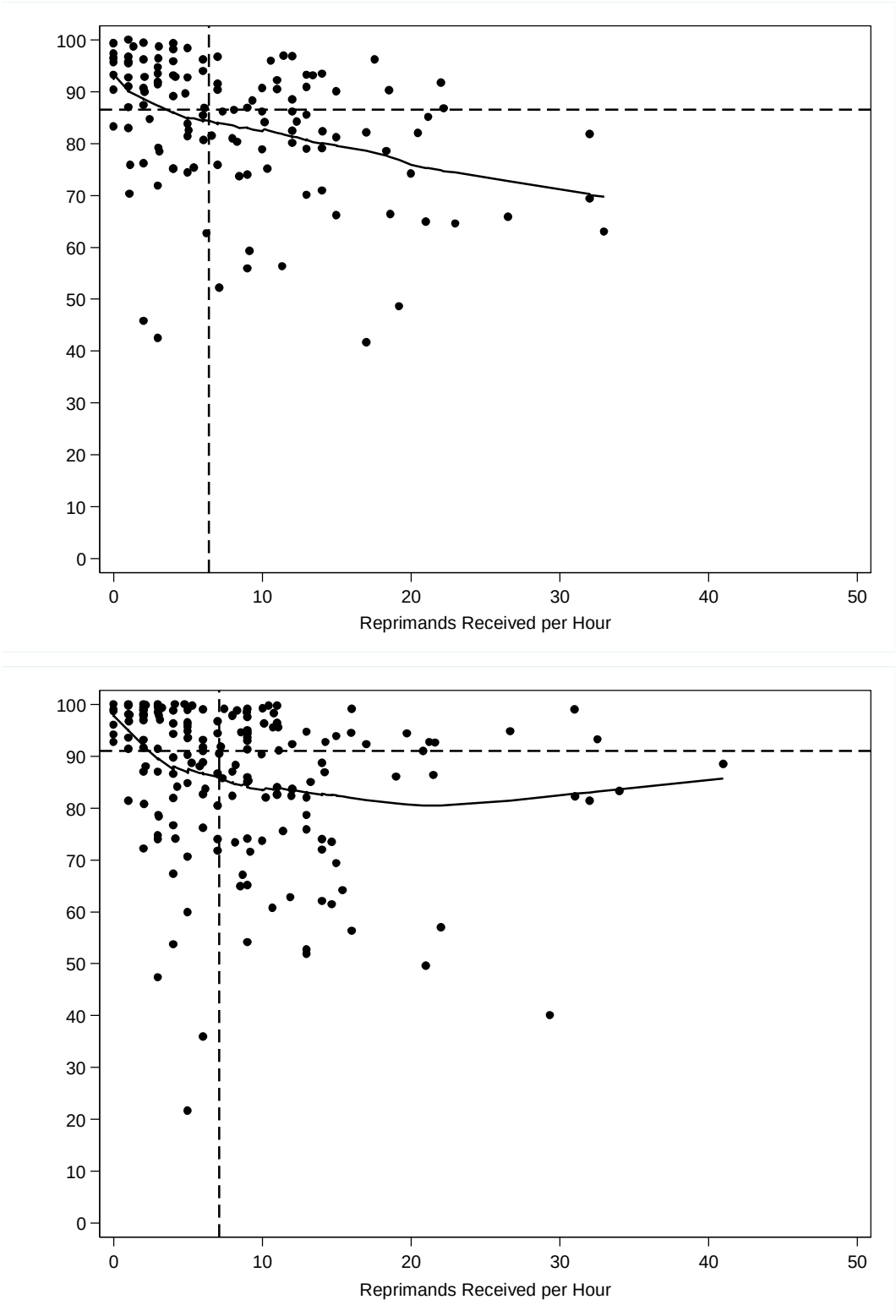

Figure 2. Scatterplots of rates of reprimands received and student engagement for students in general education classrooms (top, n = 126) and special education classrooms (bottom, n = 179). Lowess fit lines (solid lines) and median lines (dashed lines) included.

Again, Spearman's rank correlation coefficients were conducted for non-parametric measures of association (Table 6). Resulting Spearman's rank correlation coefficients indicate moderate negative relations (and moderate effect sizes) between student engagement and rate of reprimands received by the student (r_S = -.43, p < .001 for students in general education classrooms and r_S = -.34, p < .001 for students in special education classrooms). Increases in rates of reprimands received were associated with general decreases in student engagement.

Table 6

Spearman's Rank Correlation Coefficients by Educational Placement

		95 % CI	
	r_S	LL	UL
	Students in General Education Classrooms (n = 126)		
Engagement and Rate of Praise	.15	-.03	.32
Engagement and Rate of Reprimands	-.43*	-.56	-.28
	Students in Special Education Classrooms (n = 179)		
Engagement and Rate of Praise	.36*	.23	.48
Engagement and Rate of Reprimands	-.34*	-.46	-.21

Note. *p < .05

To account for correlated data within classrooms, regression analyses (one-way ANOVAs with fixed effects) were again conducted using clustered robust standard errors to estimate the relations between student engagement and reprimands received for students in each classroom setting. Similar to resulting Spearman's rank correlations, results from regression of percentage of student engagement on rate of reprimands

received (with clustered robust standard errors) indicated a negative association between the two variables for students in both general education classrooms (regression coefficient of rate of reprimands per hour $b = -.64$, $p < .001$, $R^2 = .13$, $F(1, 66) = 18.24$, $p < .001$, 95% CI [-.01, .28]) and in special education classrooms (regression coefficient of rate of reprimands per hour $b = -.42$, $p = .060$, $R^2 = .04$, $F(1, 41) = 3.75$, $p = .060$, 95% CI [-.07, .16]. Resulting regression coefficients indicate that, on average, an increase in a student receiving one additional reprimand per hour was associated with 0.64 and 0.42 decreases in percentage of time engaged in general and special education classrooms, respectively. Again, post-regression graphic and statistical diagnostics indicated violations of the assumptions of normality of residuals and homoskedasticity; tests of significance and confidence intervals are likely incorrect for these models (though the estimated regression coefficients are unbiased).

As outlined above, Spearman's rank correlations and the regression coefficients indicated a general negative association between rate of reprimands received and percentage of student engagement. However, for students observed in special education classrooms, the scatterplot and lowess fit line for reprimands received and student engagement indicated a possible U-shaped curvilinear relation between these two variables. As noted by Cohen, et al. (2003), when a relation between two variables is only "moderately well fitted by a straight line" (p. 62), the correlation coefficient will underestimate the true relation between the two variables.

Polynomial regression models were conducted to examine further the potential curvilinear relation between reprimands received and student engagement for both classroom settings. Specifically, a quadratic term (*rate of reprimands*^{2}) was added to each

initial ANOVA model to regress percent of engagement on rate of reprimand and rate of reprimands squared (again using clustered robust standard errors):

$$\textit{percent of engagement} = B_0 + B_1 \textit{rate of reprimands} + B_2 \textit{rate of reprimands}^2 + u$$

Coefficients were not centered because rate of reprimands had a true point of zero and was therefore interpretable in polynomial equations (Cohen, et al., 2003). Further, extreme multicollinearity of the predictors was not observed for either of the models (i.e., for the students in general education classrooms and students in special education classrooms).

For students observed in general education classrooms, there was a resulting negative regression coefficient on rate of reprimands per hour (b = -.87, p = .039) and a positive regression coefficient on the quadratic term (b = .009, nonsignificant p-value of .493), R^2 = .13, ΔR^2 = .003, $F(1, 66)$ = 0.48, p = .493, 95% CI [-.01, .28]. For students observed in special education classrooms, there was a similar negative regression coefficient on rate of reprimands per hour (b = -1.36, p = .001). The regression coefficient for the quadratic terms was also positive (b = .03, p < .001) for students in special education classrooms and its associated p-value was significant at the .05 level (R^2 = .08, ΔR^2 = .04, $F(1, 41)$ = 10.48, p = .002, 95% CI [-.07, .23]). These results indicate a decreasing trend in the association between reprimands and student engagement (i.e., as rates of reprimands received increases, student engagement decreases) followed by an increase in the association (i.e., an upward turn, or U-shape, in the fitted line between reprimands received and student engagement). Post-regression diagnostics indicated nonormal distribution of residuals; therefore, resulting tests of significance and confidence intervals should be considered with care. Nevertheless,

resulting regression coefficients along with visual inspection of scatterplots of rates of reprimands and student engagement indicate a U-shaped curvilinear relation between these two variables for students observed in the special education classrooms. Although increases in rates of reprimands are associated with decreasing percentage of time engaged for students with low and moderate rates of reprimands, in general, students who received the highest rates of reprimands were also observed to exhibit relatively high percentages of time engaged (see the bottom scatterplot in Figure 2).

Temporal Associations between Student and Teacher Behavior

Two concurrent time analyses (using seconds as the coded unit of analysis) were conducted for each student-teacher dyad with adequate levels of observed behaviors in an effort to assess the temporal associations between (a) teacher praise occurring concurrently with appropriate student behavior (i.e., appropriate engagement) and (b) teacher reprimands occurring concurrently with students' non-engagement. For each student, coded streams from each observation session were concatenated (for a total of approximately 3600-s of data per each student). For the first set of analyses, a lag of 0-s was used to determine the temporal relation between the teacher praise (target behavior, measured at offset) occurring in the presence of student engagement (the antecedent behavior, measured in seconds of duration). In a manner similar to the first set of analyses, a lag of 0-s was again used to determine the temporal relation between teacher reprimands (target behavior, measured at offset) occurring in the presence of student non-engagement (the antecedent behavior, measured in seconds of duration).

The purpose of the concurrent time analysis was to evaluate the temporal relations between teacher praise and student engagement and teacher reprimands and student non-engagement. At outset, the intended index to estimate these temporal associations was Yule's *Q*, which would be equivalent to an odds ratio of the occurrence or nonoccurrence of praise (or reprimands) in the presence or absence of students' appropriate engagement (i.e., odds of observed frequencies within each cell of 2x2 contingency tables). An example 2x2 contingency table for the analysis of teacher praise concurrent with student engagement is presented in Table 7, and an example 2x2 contingency table for the analysis of teacher reprimands concurrent with student non-engagement is presented in Table 8. For each student-teacher dyad, a Yule's *Q* was computed for each of the student behavior and teacher response pairs. Resulting Yule's *Q* values were examined across the sample. Values near -1 indicate that the teacher responses of interest occurred in the presence of the student's behavior less often than would be expected by chance. Values near +1 indicate that teacher responses occurred in the presence of the specified student behavior more often than expected by chance. Yule's Q absolute values of 0.6 or greater represent a large association, and values of 0.43 and 0.2 are accepted benchmarks for moderate and small associations, respectively (Rosenthal, 1996).

Data were examined for each student-teacher dyad to determine adequacy in the amount of data to accurately calculate and interpret values of Yule's *Q*. First, for each student-teacher dyad, observed frequencies in each cell of in the 2x2 contingency tables were examined to identify student-teacher dyads with zero observed frequencies in any of the cells (see Yoder, 2010). Second, expected frequencies were calculated for each cell in the 2x2 contingency tables to identify and exclude student-teacher dyads with an

expected frequency of five or less than five for any of the cells in the 2x2 contingency tables (Wickens, 1993; Yoder, 2010). Students with inadequate data were identified for exclusion from the temporal analyses.

Table 7

Example of Behavior Pair Counts in a 2x2 Contingency Table for Teacher Praise Concurrent with Engagement

		Behavior I				Total for rows
		Teacher praise			Any other teacher or student behavior	
Behavior I	Student engagement	14	A	B	3020	3034
	Student non-engagement	1	C	D	569	570
	Total for columns	15			3389	3604[a]

Note. Example data for one student-teacher dyad. Seconds as coded unit of analysis. [a]Four second adjustment to coding stream due to concatenation of data across four observation sessions (1-s added at the beginning of stream for each of the four sessions to account for the student's engagement or non-engagement status at the second just prior to beginning observation).

Table 8

Example of Behavior Pair Counts in a 2x2 Contingency Table for Teacher Reprimands Concurrent with Non-Engagement

		Behavior I				Total for rows
		Teacher reprimand			Any other teacher or student behavior	
Behavior I	Student non-engagement	8	A	B	501	509
	Student engagement	17	C	D	3078	3095
	Total for columns	25			3579	3604[a]

Note. Example data for one student-teacher dyad. Seconds as coded unit of analysis. [a]Four second adjustment to coding stream due to concatenation of data across four observation sessions (1-s added at the beginning of stream for each of the four sessions to account for the student's engagement or non-engagement status at the second just prior to beginning observation).

Teacher praise occurring during student engagement. Data from 303 of the 305 student-teacher dyads were identified as having *inadequate* data to estimate Yule's *Q* as an index of the association between teacher praise occurring during student engagement. The vast majority of students with inadequate data for the praise during student engagement analysis received zero or very few praise occurring during durations of non-engagement, (i.e., no observed occurrences of praise during student non-engagement or calculated expected frequencies equal to less than five in the 2x2 contingency table cell representing the occurrence of praise during non-engagement). With so little usable data, further analysis of Yule's *Q* as an index of the temporal association between teacher praise occurring during student engagement was not conducted.

Additional analyses were conducted to better understand teacher praise as it relates temporally to student engagement. Specifically, for each student-teacher dyad, conditional probabilities were calculated to represent: (a) the proportion of time (seconds) a student was observed to be appropriately engaged during which the student received praise from his or her teacher and (b) the proportion of teacher praise that was delivered when the student was engaged (versus praise that was delivered when the student was not engaged).

The mean conditional probabilities of teacher praise occurring during the total times when the student was appropriately engaged were .002 (.002 SD) and .004 (.004 SD) for students observed in general and special education classrooms, respectively (median conditional probabilities of .002 (with median conditional probabilities of .002 for students in both classroom types and an interquartile spread of .001 to .003 for

students in general education classrooms and an interquartile spread of .001 to .004 for students in special education classrooms). These results indicate that, across both classroom types, students received very few praise behaviors from their teachers proportionate to the overall time that they were appropriately engaged in classroom activities. On average, students in both classroom settings received teacher praise less than 1 % of the time that they were actually appropriately engaged (recall that, on average, students in both classroom settings were engaged for over 80 % of the total time observed).

The mean conditional probabilities of teacher praise delivered when the student was appropriately engaged (proportionate to total praise that was delivered when the student was and was not engaged) were .97 (.07 SD) and .96 (.09 SD) for students in general education and special education classrooms, respectively (with medians of 1 and interquartile spreads of 1 and 1 for both classroom types). These probabilities indicate that, on average (and for most of the students as indicated by the interquartile spreads), teacher praise occurred exclusively during times when the students were appropriately engaged in classroom activities. In general, students rarely received praise from their teachers during times when they were not appropriately engaged; only 57 students (18.69 % of the entire sample) received at least one instance of praise from their teachers during times when they were recorded as being not appropriately engaged. These conditional probabilities, however, do not consider base rates of both praise and student engagement.

Teacher reprimand occurring during student non-engagement. Data from 285 of the 305 student-teacher dyads were identified as having inadequate data to estimate Yule's *Q* as an index of the temporal association of teacher reprimands occurring during

times when the student was not appropriately engaged. The majority of students with inadequate data for this analysis received zero or very few reprimands during durations of non-engagement (zero observed occurrences of reprimands during non-engagement or calculated expected frequencies equal to or less than 5 in the 2x2 contingency table cell representing the occurrence of reprimands during non-engagement). Again, recall that, on average, students in both classroom types were observed to be not-engaged a very small percentage of the time. Of the remaining 20 students with adequate data to calculate Yule's *Q*, 9 of the students were from general education classrooms and 11 were from special education classrooms. Among this small subsample of students, the mean Yule's *Q* value for the association of reprimands concurrent with non-engagement was +.08 (.30 SD, values ranging from -.47 to +.47) for students in general education classrooms, and the mean Yule's *Q* value was slightly higher at +.47 (.36 SD, values ranging from -.37 to +.86) for students in special education classrooms. The median Yule's *Q* value was +.04 (interquartile spread of +.003 to +.36) for students in general education classrooms while the median Yule's *Q* value was +.57 (interquartile spread of +.30 to +.78) for students in special education classrooms. These Yule's *Q* values indicate that the direction and magnitude of the association between teacher reprimands occurring during student non-engagement ranged from moderately negative to moderately positive across both classroom types, with Yule's *Q* values indicating no association for four students in general education classrooms (see Table 9).

Table 9

Direction and Magnitude of Temporal Association between Teacher Reprimands during Student Non-Engagement for Sub-Sample of Student-Teacher Dyads[a]

	Students in General Education Classrooms (9 Students)		Students in Special Education Classrooms (11 Students)		Total Sub-Sample (20 Students)	
	n	%	n	%	n	%
Negative Association[b]						
Strong	0	0 %	0	0 %	0	0.00 %
Moderate	1	11.11 %	0	0 %	1	5.00 %
Small	1	11.11 %	1	9.09 %	2	10.00 %
No Association	4	44.44 %	0	0 %	4	20.00 %
Positive Association[b]						
Small	2	22.22 %	4	36.36 %	6	30.00 %
Moderate	1	11.11 %	2	18.18 %	3	15.00 %
Strong	0	0 %	4	36.36 %	4	20.00 %

Note. [a]Sub-sample of students with adequate data to estimate Yule's *Q* as an index of the association between teacher reprimands occurring during students' non-engagement. [b]Strength of association indicated by Yule's *Q*: .6 for a strong association, .43 for a moderate association, and .2 for a small association (Rosenthal, 1996).

Additional analyses were again conducted to examine further the temporal relation between teacher reprimands and student non-engagement for each student-teacher dyad in entire sample. Similar to the analysis for praise co-occurring with student engagement, conditional probabilities were calculated to represent: (a) the proportion of time a student was observed to not be appropriately engaged (non-engaged) during with the student received reprimands from his or her teacher and (b) the proportion of teacher reprimands that were delivered when the student was not engaged (versus reprimands that were delivered concurrent with appropriate student engagement).

The mean conditional probability of teacher reprimands occurring during the total times when the student was not engaged was .005 (.007 SD) for students in both classroom settings. The median conditional probability of teacher reprimands occurring at times when the student was engaged was .003 for students in general education classrooms and .002 for students in special education classrooms, with interquartile spreads of 0 to .007 for students in both classroom settings. This indicates that, across both classroom types, students received very few reprimands proportionate to the overall time that they were not engaged. Similar to findings related to the temporal association between praise and student engagement, students in both classroom settings received teacher reprimands less than 1 % of the time that they were observed to be not engaged (though low mean percentages of non-engagement for students in both classroom settings).

The mean conditional probabilities of teacher reprimands delivered concurrent with non-engagement (proportionate to total of all reprimands delivered to the student) were .28 (.27 SD) and .23 (.27 SD) for students in general and special education

classrooms, respectively. The median proportion of teacher reprimands that were delivered when the student was not engaged was .23 for students in general education classroom (with an interquartile spread of 0 to .47) and .15 for students in special education classrooms (with an interquartile spread of 0 to .38). These results indicate that, on average, 23 % and 15 % of all reprimands were delivered during times when students were *not* appropriately engaged. In contrast, 77 % and 85 % (for students in general and special education classrooms, respectively) of teacher reprimands occurred during times when students were appropriately engaged. Of the 189 students who received at least one reprimand during observations, 222 (76.82 %) received a higher proportion of reprimands when they were appropriately engaged when compared to the proportion of reprimands received when they were not engaged. This finding, however, is likely influenced by the average low levels of non-engagement. Recall that reprimands were coded when they were directed to either the target student individually or to a group of students of which the target student was a member. Therefore, the potential for receiving a reprimand directed toward a group of students is quite plausible even when the target student is appropriately engaged. Again, these conditional probabilities do not consider base rates of both reprimands and student engagement.

Influence of Temporal Associations on the Relation between Reprimands and Engagement

Scattergrams are presented by classroom type in Figure 3 depicting relation of overall rates of reprimands and student engagement by magnitude and direction of the association of teacher reprimands occurring during times students were not appropriately engaged (i.e., not engaged). Yule's *Q* values and a descriptor of the magnitude and

direction are included for each student depicted in the scattergrams. Only the 9 students from general education classrooms and the 11 students from special education classrooms with adequate amounts of data to calculate and interpret Yule's *Q* are included in the scattergrams. Visual inspection of the very limited data depicted in scattergrams in Figure 3 provides no indication that the temporal association between reprimands co-occurring during times of student non-engagement moderates the relation between overall rates of teacher reprimands and student engagement. No further analyses were conducted to test for an interaction between the magnitude and direction of the association of reprimands occurring during students' non-engagement and overall rates when describing level of student engagement.

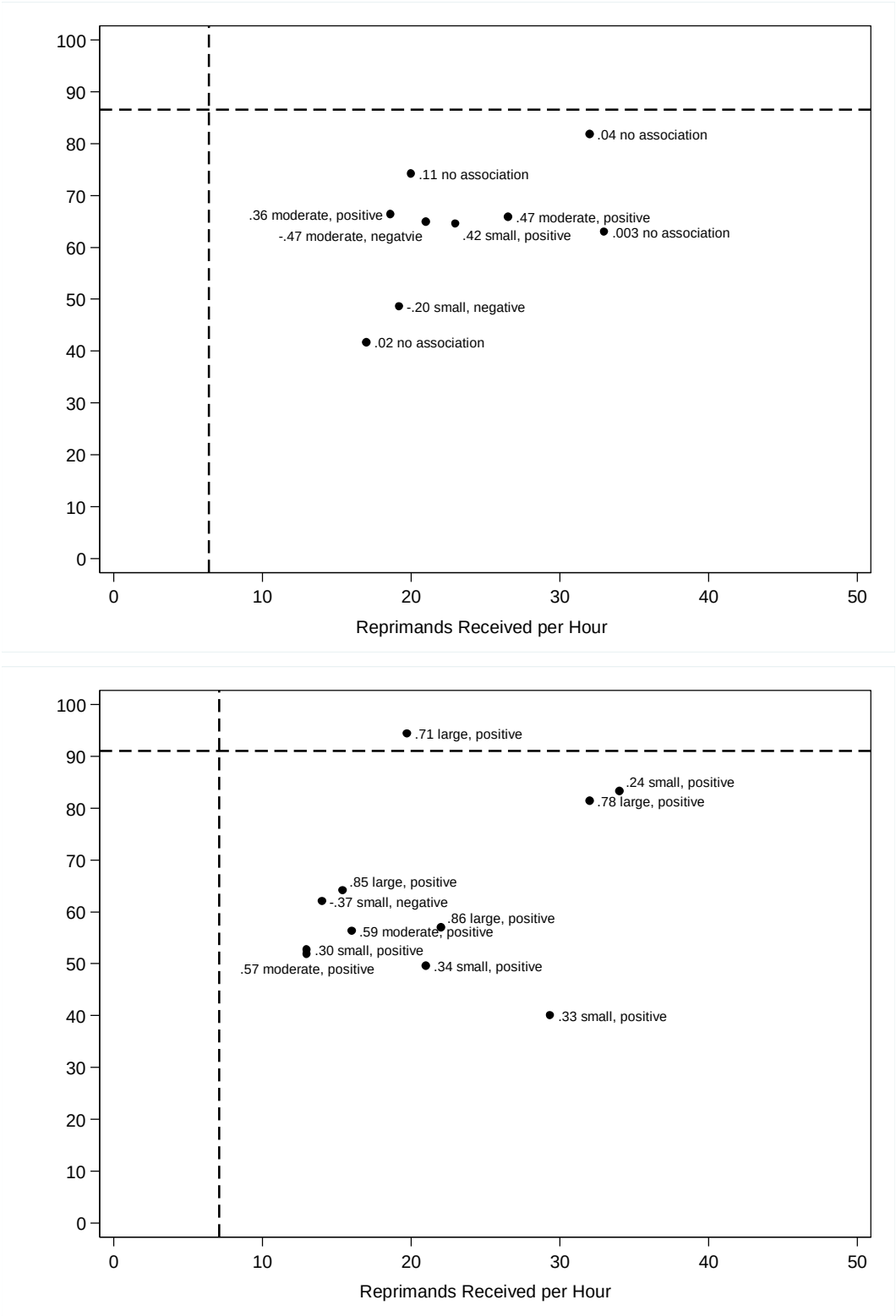

Figure 3. Scatterplots of overall rates of reprimands and student engagement by the magnitude and direction of the association (Yule's *Q* values) of reprimands occurring during non-engagement for students in general education classrooms (top, n = 9 with enough available data) and special education classrooms (bottom, n = 11). Median lines (dashed lines) included.

CHAPTER IV

DISCUSSION

Results from this study build on findings from previous classroom-based observational research and provide further detail of teachers' use of disapproval and approval in relation to students' classroom behaviors for students who have been identified as exhibiting problem behaviors across general and special education classroom settings. Students in the current study received average rates of praise that exceeded the average rates of reprimands in both classroom settings. Students in both classroom settings received an approximate average of two praise behaviors for every one reprimand behavior, with medians of approximately one praise behavior for every one reprimand received. These results are similar to findings from past research on naturally occurring rates of teacher approval and disapproval directed toward the classroom as a whole or to a group of target students (Harrop & Swinson, 2000; Merrit & Wheldall, 1987; Nafpaktitis, et al., 1985; Wheldall, et al., 1989; Winter, 1990).

Yet, higher average rates of praise than average rates of reprimands for this sample are in contrast to previous results where students identified to be at the greatest risk for problem behaviors generally received more negative than positive feedback from their teachers (Graden, et al., 1983; Lago-DeLello, 1998; Russell & Lin, 1977; Van Acker, et al., 1996; Wehby, et al., 1995). On average, the students in this sample received praise and reprimands at higher rates than was previously observed for students who were identified to be at the greatest risk for problem behaviors. In two previous studies (Van

Acker, et al., 1996; Wehby, et al., 1995), students with the greatest risk for problem behaviors received teacher praise at a range of 1.2 to 2.4 per hour and teacher reprimands at a range of 0.6 to 4.2. Students in this sample, however, received praise at average of 7.21 per hour in general education classrooms (median of 5.18) and 11.83 per hour in special education classrooms (median of 7). They also received high rates of reprimands, with an average of 8.44 reprimands per hour in general education classrooms (median of 6.42) and 8.69 per hour in special education classrooms (median of 7.08). These inconsistencies in findings across studies could have been related to inconsistencies in participant sample size, measurement sampling procedures, and behavioral definitions used to measure teacher praise and reprimands.

Simply considering aggregate data (e.g., means) on rates of praise and reprimands received provides a limited understanding of teachers' use of praise and reprimands in relation to student behavior. Results from the current study indicated a high degree of variability in the amount of praise and reprimands received by students within both types of classrooms. Rates of praise received ranged from 0 to approximately 50 praise behaviors per hour in general education classrooms and from 0 to as many as 77 praise per hour in special education classrooms. Rates of reprimands were also highly variable with ranges of 0 to 33 reprimands per hour for students in general education classrooms and 0 to 41 reprimands per hour for students in special education classrooms. Further, there was a high degree of variability in the ratios of praise received to reprimands received in both educational settings, with students receiving from as few as 0 praise behaviors for every one reprimand to as many as 44 praise statements for every one reprimand.

The majority of students in this sample were engaged at least 80 % of the observed time with a very small percentage of students observed to be engaged less than half of the time. Low frequencies of disruptive behaviors (negative talk and aggression) were observed across both classroom settings, with fewer instances of aggression observed. Data also suggests variability in observed disruptive behaviors, with a small number of students exhibiting very high rates of disruptive behaviors (e.g., as many as 45 negative talk behaviors per hour and as many as 26 aggressive behaviors per hour).

The observed variability in teachers' use of praise and reprimands was associated with variability in students' levels of appropriate engagement in classroom activities. Similar to previous findings, for this sample, higher levels of overall student engagement were generally correlated with higher levels of overall rates of praise and lower levels of overall rates of reprimands. For students observed in special education classrooms, there was a moderate, positive correlation between student engagement and overall rates of praise received. Results indicated a similar moderate, though negative, correlation between student engagement and overall rates of reprimands for these students in special education classrooms. However, for students observed in general education classrooms, there was only a small, positive correlation between student engagement and overall rates of praise. For students in general education classrooms, the correlation between engagement and rates of reprimands was stronger than the correlation between engagement and rates of praise (with a moderate, negative correlation between engagement and rates of reprimands).

Additional graphic and statistical evaluation methods provided evidence of a non-linear relation between student engagement and overall rates of reprimands for, at least,

students observed in special education classrooms. Specifically, results indicated a curvilinear (U-shaped) relation between overall engagement and reprimands for this sub-sample. While decreases in student engagement were generally associated with increases in rates of reprimands received, for at least a small number of students, higher rates of reprimands were, in fact, associated with high levels of student engagement. These results may suggest that, for some students, teachers' delivery of high rates of reprimands is "effective" in redirecting inappropriate behavior and maintaining high overall levels of appropriate student engagement. This assumption, however, has yet to be fully explored. Results suggest further that some students exhibited low levels of appropriate engagement (relative to the sample) but received low rates of reprimands or redirections from their teachers.

A major purpose of this study was to examine the role of teacher approval and disapproval as potential reinforcers for student behavior. At outset, analyses were intended to estimate the direction and magnitude of the temporal association between students' appropriate or inappropriate behavior and praise or reprimands received from their teachers to investigate directly the role of teacher approval or disapproval as potential reinforcers for student behavior. However, the structure of the data and the measurement system did not allow for thorough examinations of these temporal associations. The relation between overall rates of reprimands received by students and their engagement was predicted to be moderated by the likelihood of receiving teacher reprimands during inappropriate behavior; however, the current data set did not permit this consideration. The intended study agenda included such questions as: Are students who receive high rates of reprimands but are still relatively engaged those students whose

non-engagement frequently followed by teacher reprimands (i.e., strong, positive temporal association between problem behavior and teacher reprimands)? And, are students who receive low rates of reprimands and are rarely engaged likely to have strong, negative temporal associations between their non-engagement and teacher reprimands (i.e., problem behavior rarely results in reprimands)? These questions could not be addressed with the current data set and the current behavioral coding system.

Limitations

There are several limitations to this study in addition to those previously mentioned. In particular, data were highly skewed for all observational variables of interest which limited the use and appropriateness of traditional parametric analyses. The non-normality of data could have resulted from sampling procedures (e.g., sampling only students identified as exhibiting problem behaviors) as well as measurement procedures (e.g., behavioral definitions and coding systems). Statistical evaluation methods did not allow for the consideration of potential extraneous variables that may have been related to primary variables of interest. Future research efforts should involve thoughtful strategies to increase the likelihood of collecting data that are more closely aligned with a normal distribution. For example, future research should include more diverse participant samples (i.e., with differing levels of behavioral competence) and, perhaps, increased classroom observation times to accurately capture variance in teachers' use of praise and reprimands as well as student behavior.

Further, regression analyses were conducted using clustered robust standard errors to account for correlated data within classrooms; however, the existing data set did not

allow for a focused examination of teachers' use of praise and reprimands *within* or *across* classrooms. Additional research is needed to provide an examination of patterns of teachers' use of praise and reprimands within and across classrooms. To do this, researchers should observe teachers' interactions with multiple students in each classroom who exhibit differeing levels of behavioral competence (e.g., observing teachers' praise and reprimands as they relate to the behaviors of an adequate sample of their students who exhibit high, moderate, and low behavioral competence).

The current coding system did not allow for analyses of *forms* of teacher approval or disapproval to build on previous research. For example, the coding system did not include considerations of the appropriateness of teacher approval or disapproval such as whether the teacher provided praise following students' following the student's appropriate behavior rather than following the student's inappropriate behavior. Also, no distinctions were made regarding approval or disapproval in response to students' academic or social behavior or whether approval or disapproval was delivered to the target student individually or to a group of students. Future refinements to the coding system and behavioral definitions are needed to address these limitations.

In addition, the current data collection procedures and coding scheme did not allow for a thorough analysis of the temporal association between student engagement and teachers' use of praise and reprimands. To calculate and interpret Yule's *Q* values, higher baserates of each option within behavioral pairs are needed. A usable Yule's *Q* value would require at least one observed frequency recorded in each of the four cells of a 2x2 contingency table (as in Table 8) and expected values greater than five in each of the four cells. Many students in this sample received too few instances of teacher

behaviors of interest (praise or reprimands), and many students also exhibited very few seconds during which they were coded as being non-engaged. Perhaps refinements to the current behavioral coding scheme or increased observational times are needed to capture more instances of each type of behavior (e.g., adequate base rates of engagement and non-engagement as well as adequate base rates of the teacher behavior of interest). Future studies should include purposeful observational methods to examine teacher approval and disapproval as potential reinforcers for student behavior and to examine the interaction between the function of problem behaviors and students' overall levels of engagement.

Implications for Research and Practice

Researchers should continue to examine teachers' use of praise and reprimands in relation to students' problem behaviors. In particular, researchers should consider factors that potentially influence variability in teachers' use of praise and reprimands as well as factors that influence the relation between teacher praise or reprimands and student engagement (i.e., researchers should consider factors such as classroom instructional characteristics or student or teacher characteristics that influence the effectiveness of teachers' use of praise or reprimands to reduce inappropriate behaviors and increase appropriate behaviors). Further research is needed to examine the possible interrelatedness of rates of praise and reprimands received, students' appropriate and inappropriate behaviors, and other student academic and social outcomes. An examination of changes in teachers' use of praise and reprimands and student behaviors and outcomes over time may be particularly informative.

Results of this study highlight profound differences in the amounts of praise and reprimands that individual students receive from their teachers. Teachers and other practitioners should be mindful of potential variability of amounts of praise and reprimands that are delivered to students. These professionals should be further cognizant of the interrelatedness of teacher praise and reprimands and students' appropriate or inappropriate engagement in classroom activities. In particular, results of this study indicate a negative correlation between student engagement and reprimands received across both educational settings (with evidence of a curvilinear relation). Teachers should be particularly aware of potential variability in the relation between student engagement and teachers' use of reprimands. For example, results of this study suggest that although some students received high rates of reprimands from their teachers, they were still appropriately engaged for a majority of the observation times. There were also students who received very few reprimands despite relatively low levels of appropriate engagement and some students for whom teachers delivered high rates of negative attention in the form of reprimands with little associated improvement in student behavior. Teachers should be aware of potential variability in the effectiveness of their use of praise or reprimands in reducing inappropriate behaviors and increasing appropriate behaviors when planning for, engaging in, and reflecting on interactions with their students. A function-based perspective to understanding student behavior requires teachers to move beyond a simple consideration of the amount and form (i.e., approval or disapproval) of their responses to student behavior to include a thoughtful understanding of how their use, misuse, or disuse of praise or reprimands likely influences (reinforces or punishes) specific behaviors for individual students within a classroom.

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