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The effects of performance feedback with goal setting on effective teaching behavior

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THE EFFECTS OF PERFORMANCE FEEDBACK WITH GOAL SETTING ON EFFECTIVE TEACHING BEHAVIOR

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ABSTRACT

The Effects of Performance Feedback and Goal Setting

on Effective Teaching Behavior

By

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Research indicates that classroom management is one of the greatest challenges and most significant concerns facing teachers today. Teachers, particularly in urban schools, are faced with high rates of student problem behavior. Teachers in urban schools are less likely to be designated highly qualified. Urban districts evidence high rates of teacher attrition that is due, in part, to classroom management. To date, little research is available on how to effectively improve the management skills of general education teachers including students with challenging behavior in their classrooms. A pivotal component of behavior management is effective teaching. Performance feedback with goal setting is identified in the literature as a successful intervention for improving specific aspects of teacher's performance. The purpose of this study was to investigate the effectiveness of performance feedback with goal setting on increasing effective teaching behavior.

Four teachers from an urban middle school and their students participated in the study. Observations, 15 minutes in duration, were conducted four to five times per week. Teachers were taught to read performance feedback graphs and set goals based on their performance. They also participated in weekly goal setting meetings.

The effects of the intervention were assessed using a multiple-probe across participants design. The data addressed eight specific research questions related to the teacher's ability to increase their use of effective teaching behavior and the corresponding impact of teacher behavior on student behavior. Teaching behavior of interest in this study included opportunities for student responses, academic praise, behavioral praise, academic corrective feedback, and behavioral corrective feedback. Student behavior of interest includes percentage of correct academic responses and disruptive behavior.

Data were analyzed using the *BEST™ System*. For three teachers, performance feedback with goal setting increased their rate of opportunities to respond and academic praise. Behavioral corrective feedback also displayed an increase during intervention, except for Teacher 4. Behavioral praise remained low, at or near baseline levels. The consistently high percentages of students' correct academic responses across baseline and indicated a ceiling effect while the rate per minute of correct academic responses paralleled increases in opportunities to respond. Results from a social validity survey administered at the end of intervention indicated that teachers liked the intervention and felt it had beneficial effects.

Results of the current study suggest that the efficacy of performance feedback with goal setting varied across target behaviors and participants. Future studies should include

consideration of complimentary interventions to improve teachers' skills, student achievement, durability and generalization of behavior change, and the effects of intervention on teacher stress and retention.

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Dedicated to Rebecca Skelton

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ride would entail but made it all possible and has never once doubted I would see it through. I truly could not have done this without you.

CHAPTER 1

INTRODUCTION

Urban schools are diverse and complex communities. Students are often more different from one another than alike and it is not uncommon for a multitude of languages, cultures, and ethnicities to be represented within a single school (National Center of Education Statistics [NCES], 2000). Teaching and learning in schools is complicated by concerns of disruptive behavior and safety of staff and students that influence the daily interactions between teachers and students (NCES, 2000). While the rates of violent crimes at schools are low, 40.9% of teachers report that the level of student misbehavior in their school interferes with their teaching (NCES, 2000). In fact, one half of all available instructional time is lost to other activities and discipline accounts for a significant portion of this lost time (Cotton, 1990).

Students in urban environments are more likely to arrive at school with learning histories that may predispose them for future behavioral problems (Nelson, 2000). Family stressors, such as poverty, lack of support, and high rates of anti-social behavior in the community can negatively affect parenting (Dishion, Patterson, Stoolmiller, & Skinner, 1991). These stressors can result in poor parenting skills that lead to more reactive, infrequent, arbitrary, and aversive parent-child interactions (Lewis & Sugai, 1999). As a result of a history of reactive and arbitrary interactions, challenging behavior is developed and maintained by negative reinforcement from an early age (Conduct

Problems Prevention Research Group, 1992). Students with this history are more likely to use inappropriate behavior to try to control their environment, including their school environments (Quinn, Jannasch-Pennell, & Rutherford, 1995).

At urban schools students tend to engage in more risk-taking and inappropriate behavior that requires teacher discipline, which is reflected in higher rates of students referred for disciplinary action than seen in suburban and rural schools (Lippman, Burns, & McArthur, 1996). Students with challenging behavior include not only students with emotional behavioral disorders but also students with other disabilities, and students who have not been diagnosed with a disability but engage in inappropriate behavior.

The consequences of higher rates of challenging behavior in urban schools are evident in a variety of domains. Teachers in urban schools are more likely to be threatened or attacked than their counter parts in rural or suburban schools and instruction is more likely to be disrupted by student behavior (DeVoe, Peter, Noonan, Snyder, & Baum, 2005). This is more likely in middle and high schools than elementary schools (DeVoe et al., 2005). In response to escalating discipline problems, personnel in urban districts are much more likely to implement zero tolerance policies and to rely on exclusionary discipline actions such as suspension and expulsion (NCES, 2005). Suspension is used more frequently with students who qualify for free or reduced cost lunch programs (Nichols, Ludwin, & Iadicola, 1999) and African American males (Townsend, 2000) than with students from higher income families and white students. Frequent suspensions are a strong predictor of future involvement with the juvenile justice system (Baker et al., 2001).

The challenges presented within urban settings necessitate the identification of strategies that can adequately address student and teacher needs (Utley, Koleski, Smith, & Draper, 2002). High rates of antisocial behavior in schools are associated with punitive discipline, a lack of clarity on rules, expectations, and consequences (Mayer, 1995). Rather than serving as a deterrent, punitive responses that occur outside the context of a positive, school-wide system are associated with increased aggression, vandalism, tardiness, truancy, and dropping out of school (Mayer & Sulzer-Azarfoff, 1991).

A national random sample survey of parents and teachers of middle and high school students found that, out of 725 teacher and 600 parent respondents, 89% agree that behavior management is a fundamental responsibility of teachers (Public Agenda, 2004). Yet 85% of those teacher respondents thought new teachers are unprepared to deal with classroom behavior management issues. Results from the same survey indicated that 34% of respondents reported knowing colleagues who have already quit or who have been asked to leave over student discipline issues and 34% admitted they have seriously considered leaving their profession due to issues related to student discipline. Indeed, classroom behavior management is a challenge for teachers of all experience levels and across all content areas (Garrahy, Cothran, & Kulinna, 2005).

Classroom Behavior Management

Teachers identify management of students with severe problem behavior as their greatest challenge and most significant concern (Weigle, 1997). These concerns are evident for both preservice and inservice teachers. A survey of undergraduate education students, faculty from colleges of education, school administrators, and teachers

identified classroom management, behavior management, and instructional design the top three highest priority needs for preservice teachers (MacPherson-Court, McDonald, & Sobesy, 2003). New teachers report that they need more direct experience with skills such as classroom management (Meister & Melnick, 2003) and instruction delivery (Whitaker, 2003). Another survey of secondary general education teachers and university teacher educators found that best practices for students with disabilities were not adequately addressed in teacher preparation programs (Gately & Hammer, 2005). After graduation, 33% of new teachers find themselves unable to handle student behavior and they attribute this partly to having learned about classroom behavior management predominantly through lectures or mock lessons that do not represent the realistic challenges in schools (Meister & Melnick, 2003).

Special and general education teachers report that they have insufficient resources and lack expertise in implementing research-validated practices (Ayres, Meyer, Erevelles, & Park-Lee, 1994). Among general educators, there is an assumption that special educators are better equipped to handle the behavioral needs of students with challenging behavior (Weigle, 1997). However, Weigle found both groups of educators have weak behavior management skills and are likely to apply interventions randomly rather than systematically. Teachers in middle schools and high schools report feeling significantly less ready, willing, and able to manage difficult classroom behavior than teachers in elementary schools (Baker, 2005). Baker also found a significant correlation between perceived self-efficacy and teacher readiness for managing behavior.

While many teachers lack the confidence to deal with direct challenges from students, improving their perceptions of self-efficacy can increase their readiness to manage

student behavior. Teachers who are trained to use a variety of strategies to manage instruction and discipline in their classrooms appear to be more ready to teach in diverse settings (Baker, 2005). Classroom teachers are willing to accommodate a greater range of needs and abilities when they feel confident in their own ability to teach and manage students effectively (Hamil & Dever, 1998). Teachers also report that if they believe they can effectively educate their students, then they are more willing to persevere through challenging tasks, such as managing disruptive behavior (Bandura, 1993). Feeling better prepared results in greater confidence, which makes teachers more willing to persevere when dealing with challenging student behavior.

When teachers do not implement effective management practices, student behavior deteriorates (Sugai et al., 1999). This cycle is detrimental to students and teachers who are struggling to manage situations for which they do not have the requisite skills. This leads to frustration, poor progress toward educational goals, and feelings of inadequacy among teachers (Weigle, 1997). The combination of these factors can be extremely stressful (Bauer et al., 2006).

Effects of Teacher Stress

Teaching can be a demanding and stressful occupation. Issues related to classroom discipline are consistently identified as one of the most significant sources of stress among teachers (Borg, Riding, & Falzon, 1991; Keiper & Busselle, 1996; Kryiacou, 1987). Teachers frequently report experiencing stress when attempting to manage disruptive student behavior in the classroom (Lewis, 1999). Interestingly, it is not necessarily the disruptive behavior that causes stress, but rather the teacher's inability to manage the situation effectively that increases stress levels (Lewis, 1999). Of the

strategies teachers use to address classroom behavior management and its associated stress, one of the least common is seeking help from a professional and one of the most common is working harder (Lewis, 1999). Working harder when the difficulty appears to be a skill deficit could potentially be counter-productive if teachers invest more energy into ineffective behavior management strategies.

Many variables, such as salary and paperwork, contribute to teacher stress and influence teacher attrition rates (Flowers, 2003). However, 50% of urban teachers leave the profession within the first five years and cite stress related to classroom behavior management as one of the factors influencing their decision (National Commission for Teaching and America's Future, 2002). In a survey of Texas teachers on reasons why teachers leave their profession, Flowers (2003) identified 10 significant factors contributing to teacher attrition. Among these were job stress, frequency of discipline problems in classrooms and schools, and a lack of respect from students (Flowers, 2003). Of the 220 teachers surveyed, 65% agreed that discipline problems were a significant factor in teacher attrition.

It should not be surprising that general education teachers are struggling to effectively manage today's classrooms, nor that attempting to do so is a significant source of stress. A significant percentage of students with disabilities are educated for at least part of the school day in general education classrooms. Nationally, 76.3% of students with disabilities spend more than 40% of the day in a general education classroom (Office of Special Education Programs (OSEP), 2003). This includes 39.64% of students with autism and 50.18% of students with emotional disturbance (OSEP, 2003). Both are groups of students who commonly exhibit challenging behavior (Heward, 2003).

All students suffer the consequences when their peers engage in challenging behavior. Teachers usually perceive disruptive behavior as aversive and, when it occurs, they often avoid engaging with students in an attempt to minimize further occurrences of problem behavior (Carr, Taylor, & Robinson, 1991). This avoidance results in decreased instructional opportunities as teachers focus on non-problem areas and avoid difficult or volatile situations (Wehby, Symons, Canale, & Go, 1998; Weigle, 1997). Higher rates of challenging behavior detract from safe and orderly school environments and reduce learning opportunities for all students by deflecting teacher time from instruction. The percentage of students who feel unsafe going to school slowly increased from 4.0% in 1997, to 5.2% in 1999 and 6.6% in 2001 (NCES, 2005).

The research literature includes effective methods to address the behavioral issues faced by teachers and schools, but translating this research into durable practice continues to be a significant challenge (Sugai & Horner, 2002). In urban schools, where staff struggle to address a variety of challenging student behavior and students are poorly equipped for successful school experiences, it is necessary to develop systems that increase teachers' capacity to use validated instructional and behavioral strategies. School-wide Positive Behavior Support (SWPBS) is a promising practice for urban schools precisely because it integrates staff training, research, and the development of culturally appropriate practices (McCurdy, Mannella, & Eldridge, 2003).

School-wide Positive Behavior Support

School-wide Positive Behavior Support is a proactive and preventative approach to school discipline at the systems level (Sugai & Horner, 2002). It combines the science of human behavior with socially valid outcomes, research validated practices, and systems

change theory to generate meaningful and durable effects in schools (Sugai & Horner, 2002). Four levels of intervention are developed in SWPBS: (a) school-wide, (b) classroom, (c) non-classroom areas, and (d) individual student. The school-wide literature includes numerous case studies of successful implementation and is moving towards empirical support for the complex process of school change (Luiselli, Putnam, & Sunderland, 2002; Taylor-Greene et al., 1997). The literature on individual student behavior support is well developed in the fields of applied behavior analysis and positive behavior support (e.g., see *Journal of Applied Behavior Analysis, Journal of Positive Behavior Interventions, Behavioral Disorders*). Literature on effective strategies for non-classroom areas is also emerging (Colvin, Sugai, Good, & Lee, 1997; Lewis, Powers, Kelk, & Newcomer, 2002). Literature on classroom level interventions in schools implementing SWPBS is less abundant and classroom components are not well represented in the school-wide literature to date (Kern & Manz, 2004).

The SWPBS approach emphasizes culturally appropriate practices and systems that consider the needs and histories of everyone involved in the school (Sugai et al., 1999). Contextual fit encompasses the concepts of ecological and social validity. An intervention with good contextual fit is compatible with the values and skills of stakeholders, sustainable given available resources, and suitable for the needs of the students with challenging behavior (Albin, Lucyshyn, Horner, & Flannery, 1996). Poor contextual fit can result in the failure of otherwise well-conceived interventions whereas good fit increases the likelihood of intervention success. In schools, contextual fit includes knowing what is required and having the necessary skills, resources, and supports to implement intervention (Horner, Salentine, & Albin, 2003).

A primary focus of SWPBS is the remediation of deficient environments. Schools frequently employ reactive models of behavior management, waiting until students engage in problem behavior before acting. In effective environments with staff that are skilled at proactive, positive behavior strategies, students with challenging behavior are able to learn new ways of interacting appropriately. It is more efficient for staff to put a majority of their time, energy, and resources into proactive planning to prevent or reduce reoccurrences of inappropriate behavior (Lewis & Sugai, 1999). SWPBS builds effective environments through team-led staff development, skill-specific staff training, explicit instruction for students on behavior and expectations, implementation of procedures to increase appropriate behavior and decrease inappropriate behavior, and reliance on data-based decision-making (Sugai et al., 2005). Included in staff development is training on effective teaching as an important component of classroom behavior management.

Effective Teaching Behavior

Effective teaching behavior includes delivery of high rates of opportunities for student responses, a high ratio of praise to corrective statements, and delivery of reinforcement (e.g., a praise statement) immediately after a desired behavior has occurred (Sutherland, Wehby, & Copeland, 2000). Latham (1992) recommends a ratio of six to eight positive statements to every negative statement with at-risk populations. However, 4:1 is another ratio commonly referred to and an absolute ratio has not been established (Sugai, 2005). Target rates of opportunities for student responses range from 4-6 per minute for new material to 8-12 per minute for review and drill (Council for Exceptional Children [CEC], 1997). An increase in rate of opportunities to respond is related to

increased academic progress (Englert, 1984) and lower rates of disruptive behavior (Sutherland, 2001).

While a variety of different effective teaching behavior has been identified, teachers continue to struggle with mastering effective instructional and behavior management skills (MacPherson-Court et al., 2003). One method that has the potential to help teachers develop more effective skills is performance feedback with goal setting. Performance feedback includes providing information regarding performance of a specific behavior (Scheeler, Ruhl, & McAfee, 2004). Goal setting refers to the process of establishing a performance criterion for a behavior and reviewing behavior performance in relation to that goal over a period of time (Ann Boyce & Kelly, 1992).

Performance feedback has the potential to be an effective method for changing inservice teacher behavior. Receiving feedback that indicates behavior is changing in the desired direction is reinforcing and can encourage teachers to persevere with the effort of changing their behavior. This is important given the high levels of stress and frustration related to student discipline that teachers report. Systematic observations may help the teacher by providing a picture of behavior over time, allowing for multiple opportunities to modify behavior in response to feedback. Goal setting has the potential to enhance the effectiveness of performance feedback. A goal can function as an establishing operation for effective teacher behavior (Agnew, 1998). Michael (1982, 1993) defines an establishing operation as a motivating variable that: (a) briefly alters the value of a reinforcer and (b) briefly alters the frequency of the behavior that has been consequated with that reinforcer in the past. Thus, establishing a goal for personal behavior change makes performance feedback more reinforcing to the recipient (Agnew, 1998). For

example, receiving daily performance graphs and positive verbal feedback can motivate teachers to increase or decrease target behavior towards an established criterion. Receiving feedback that describes their progress reinforces teachers to continue their behavior change efforts.

Statement of the Problem

Students in urban schools are more likely to come to school with a history that predisposes them to learning and behavioral difficulties (Dishion et al., 1991). They exhibit higher rates of disruptive behavior (Lippman et al., 1996). Teachers identify managing disruptive behavior as an area of weakness (Baker, 2005; MacPherson-Court et al., 2003; Weigle, 1997). They attribute being unprepared to manage disruptive behavior to a lack of training and practice in classroom behavior management (Meister & Melnick, 2003). These feelings of preparedness and willingness to manage disruptive behavior decrease as grade level taught increases, meaning teachers in middle and high schools are at a greater disadvantage than their colleagues in elementary schools (Baker, 2005). Potential teacher outcomes of poor classroom behavior management include reduced willingness by teachers to tolerate diversity in their classrooms (Hamil & Dever, 1998), increased stress (Lewis, 1999), and risk of attrition (National Commission for Teaching and America's Future, 2002). Potential student outcomes of poor classroom behavior management include reduced learning opportunities (Carr et al., 1991), higher levels of reactive and punitive discipline (Weigle, 1997), and increased levels of anti-social behavior (Mayer & Sulzer-Azaroff, 1991).

Purpose of the Study

The purpose of this study was to examine the effectiveness of performance feedback with goal setting on classroom teachers' effective teaching behavior and to subsequently examine the impact that changes in teacher behavior have on student behavior. Specifically, three broad research questions were addressed. First, what were the effects of training teachers to read performance feedback graphs and engage in goal setting related to their use of targeted effective teaching behavior? The targeted behaviors in this study were opportunities for student responses, academic praise, academic corrective feedback, behavioral praise, and behavioral corrective feedback. Second, did increasing the rates of effective teacher behavior increase students' percentage of correct academic responses and decrease students' rates of disruptive behavior? Third, were teachers satisfied with the contextual fit of performance feedback with goal setting and its effect on their abilities to manage student behavior?

Research Questions

1. Does training teachers to read performance feedback graphs and engage in goal-setting increase their rate of opportunities for student responses?
2. Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of academic praise and corrective feedback?
3. Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of behavioral praise and corrective feedback?
4. Are teachers who receive performance feedback graphs and engage in goal setting able to achieve and maintain a ratio of 4:1 praise to corrective statements?

5. To what extent does increasing the teacher's rates of effective teaching behavior result in an increase of students' percentage of correct academic responses?
6. To what extent does increasing the teacher's rates of target behavior result in a decrease of students' rates of disruptive behavior?
7. To what extent are the teacher participants satisfied with the contextual fit of the goals, outcomes, and procedures of the intervention?
8. To what extent do teacher participants feel better prepared to meet the needs of students with challenging behavior in their classrooms?

Significance of the Study

School personnel within urban schools face challenges unique from those faced by their suburban and rural counterparts. For example, a higher percentage of students engage in risk-taking and other challenging behavior and there are higher rates of teacher attrition, which is related primarily to student discipline. Students in urban schools are more likely to come to school predisposed to engage in socially inappropriate behavior as a result of multiple environmental risk factors in their homes and communities. Challenging students require highly skilled teachers. Unfortunately, urban school administrators often have difficulty attracting and retaining highly qualified teachers (Fideler, Foster, & Schwartz, 2000). Teacher education programs leave many new teachers feeling unprepared to manage real-life classroom environments where they face multiple and complex demands. In light of all of these factors, school personnel need effective methods for supporting teachers in the area of classroom behavior management. The implementation of such methods has the potential to reduce some of the stressors felt

by teachers faced with seemingly unmanageable situations and growing feelings of incompetence.

Two instructional techniques that can increase student learning and appropriate behavior are the rate of opportunities to respond and teacher praise. When teachers implement these at high rates, student learning and appropriate behavior increases (Broden, Bruce, Mitchell, Carter, & Hall, 1970; West & Sloane, 1986). Performance feedback with goal setting procedures have been demonstrated effective at increasing the effective teaching behavior of preservice teachers (e.g., Ann Boyce & Kelly, 1992; Miller, 1994; Sharpe, So, Mavi, & Brown, 2002). The effects of performance feedback with goal setting have not been studied with inservice teachers or specifically within urban schools. The current study examined the effects of performance feedback with goal setting on general education teachers at an urban middle school.

This study provides several potential benefits. First, the teachers who participated in the intervention may benefit in terms of increased effective teaching behavior, perceptions of efficacy, and capacity to manage students with challenging behavior. Second, the students in these teachers' classrooms may benefit academically and behaviorally as a result of higher levels of effective teaching behavior. Students in other classes taught by the teachers could also benefit if the teachers are able to generalize the skills. Third, this study contributed to the SWPBS literature. There is a need for more research on the application of behavioral technology at the middle school classroom level. Fourth, the field of teacher education, for both special and general education, will benefit, as the findings of this study addd to the research base for performance feedback with goal setting as well as emphasizing the need to address classroom behavior

management more thoroughly. Finally, teacher induction and mentoring programs in school districts may benefit from detailed information on a strategy for developing effective teaching behavior.

Limitations of the Study

This study included a limited number of participants, four teachers of integrated classrooms from a large urban middle school. Caution should be exercised in extrapolating findings to teachers in self-contained classrooms or teachers in elementary or high schools. Additionally, results may not apply to schools that are not located in urban environments. The study was conducted in a school that is actively engaged in SWPBS, which means staff dedicate a substantial portion of professional development time to issues related to school discipline and student behavior. Therefore, findings are not necessarily generalizable to teachers in schools that are not implementing SWPBS. Finally, the school administrator was very supportive of the study and communicated this support to participants. Two of the participants were approached by the administrator and nominated for participation. The other two participants answered a request for participants made to the SWPBS team. The results may not generalize to teachers in schools where the administrator is not supportive or to a situation where support has not been communicated.

Definitions

1. Behavioral Evaluation Strategy and Taxonomy Software - A software program that enables the user to conduct real-time data collection of multiple

responses using a highly individualized category system (Sharpe & Koperwas, 1999).

2. Classroom behavior management - All teacher activities directed at creating and maintaining a positive, productive classroom that is conducive to the learning of all students (Barbetta, Norona, & Bicard, 2005).
3. Contextual fit - The degree to which an intervention is compatible with the values, skills, and available resources of relevant stakeholders (Albin et al., 1996).
4. Corrective feedback - A verbal statement or physical gesture that communicates disapproval of an academic or social behavior or provides information about the desired behavior (Hall, Lund, & Jackson, 1968).
5. Effective teaching behavior - Instructional practices that are supported by a body of research literature. In this study, effective teaching behavior refers to corrective feedback, opportunities for student response, and praise.
6. Goal setting - The process of establishing performance criteria for a behavior and reviewing that goal in relation to behavior performance over a period of time (Ann Boyce & Kelly, 1992).
7. Inclusive Schools Project – A school district program, including professional development and school planning, that helps school staff educate students with disabilities in the general education classroom.
8. Level – The mean of the data within a study condition (Kennedy, 2005).
9. Magnitude –The qualitative amount of trend visible in graphical data, described as high, medium, or low (Kennedy, 2005).

10. Opportunities to respond - Occasions arranged by the teacher during which students are able to respond to an academic request (Sutherland, 2001).
11. Performance feedback - Information given regarding an individual's performance of specific behavior and the medium through which that information is delivered, for example graphs or verbal statements (Scheeler et al., 2004).
12. School-wide Positive Behavior Support (SWPBS) - A proactive and preventative approach to school discipline at the system level (Sugai & Horner, 2002).
13. Slope – The upward or downward slant of graphical data within each study phase (Kennedy, 2005)
14. Teacher praise - An affirmative verbal statement or physical gesture that communicates approval of an academic or social behavior (Mesa, Lewis-Palmer, & Reinke, 2005).
15. Time plot – A visual display of an observation session that depicts all behavioral events on the left vertical axis and the elapsed session time on the horizontal axis (Sharpe & Koperwas, 2003).
16. Transiency rate – The number of students who leave a school during the school year, represented as a percentage of the total enrollment.

Summary and Overview of Remaining Chapters

Effective classroom behavior management is a pressing concern in urban schools. Teachers consistently identify it as a priority for improvement and source of significant

stress in their jobs. Students in urban schools present high rates of challenging behavior and require effective behavioral and instructional interventions in order to ameliorate the effects of other risk factors in their environments. In addition to having difficulty recruiting highly qualified teachers, urban schools experience high rates of attrition in the first years of employment. A significant contributor to this attrition is classroom behavior management related stress. In order to retain good teachers and support struggling teachers, school personnel require effective and efficient procedures for developing quality behavior management systems. The purpose of this study was to examine the effects of a classroom level support system for teachers within the context of a school-wide behavior system.

In Chapter 2, a review of the relevant literature is presented. Chapter 3 contains a description of the methodology used in the study. The results of the study and a discussion of the implications are provided in Chapters 4 and 5.

CHAPTER 2

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to summarize and analyze two bodies of experimental research. The first is related to the effects of specific teaching behavior on student performance. The second is related to the effects of performance feedback on teacher performance. The chapter begins with a discussion of the literature review procedures. Then selection criteria used to determine which studies would be included in the review are described. Next, there is a review and analysis of the literature related to the effect of specific teaching behavior on student performance. This is followed by a review and analysis of the literature related to the effects of performance feedback on teacher performance. The chapter concludes with a summary of all the literature reviewed with a focus on the questions that require further research.

Literature Review Procedures

A systematic search through the following computerized databases was conducted: Academic Search Premier, Cambridge Scientific Abstracts, Elton B. Stephens Company (EBSCO), Education Full Text, Education Resources Information Center (ERIC), Journal Storage (JSTOR), Professional Development Collection, ProQuest Dissertations and Theses, PsychINFO, and Web of Knowledge. The following descriptors were used: behavior, behavior management, classroom discipline, classroom management, clinical

supervision, education, feedback, goal setting, effective teaching, opportunities to respond, performance feedback, praise, systematic observation, teacher, and teacher effectiveness.

A manual search was conducted through the previous 5 years of the following journals: *Journal of Applied Behavior Analysis, Journal of Emotional and Behavior Disorders, Journal of Instructional Psychology, Journal of Positive Behavior Interventions, Teacher Educator*, and *Teaching and Teacher Education.* An ancestral search through the reference lists of obtained articles was also conducted.

Selection Criteria

For the review of literature related to effective teaching behavior, studies were included in the review if: (a) the purpose of the study was to examine the effects of adult behavior on student behavior, (b) data on student behavior change were presented, and (c) the study employed an experimental or quasi-experimental design. Studies were excluded if: (a) data on behavior change were not presented, (b) the setting for intervention was not school related, or (c) the study did not implement a behavior change procedure.

For the review of literature related to performance feedback with goal setting studies were included in the review if: (a) the participants were preservice or inservice teachers, (b) study outcomes focused on teacher behavior, (c) at least one intervention condition included feedback from a supervisor or consultant, (d) the intervention included feedback or feedback combined with goal setting, (e) feedback included data from direct observation of teacher behavior, and (f) the study employed an experimental or quasi-

experimental design. Studies were excluded if: (a) the study was not written in English, (b) the purpose of the study was to examine behavior management skills without implementing an intervention, or (c) the participants were not teachers.

Review and Analysis of Studies Related to the Effects of Teacher Behaviors on Student Performance

Teachers use a variety of skills to direct the learning and behavior of students. Opportunities to respond and teacher praise have been identified in the literature as two instructional behaviors that can increase learning rates and decrease disruptive behavior. The effectiveness of these strategies is reviewed in the following sections.

Opportunities to Respond

Carnine (1976) compared the effects of two different rates of teacher presentation on first-grade students' off-task behavior, correct responding, and participation during reading instruction. Two low performing students, one boy and one girl, were selected by their teachers for participation. The student participants scored second month and eighth month of kindergarten in reading on the Wide Range Achievement Test given. Two other students were also in the lowest reading group. The teacher sat with these four students around her on chairs in a semicircle at the back of the class for reading instruction. The other students in the class worked elsewhere in the classroom at this time. The data collectors sat in front and to the side of the reading group.

The teacher used the *Level I Distar Reading Program*, a highly structured program that breaks down component reading skills and teaches each skill explicitly. The manual provides very specific instructions for the teacher to follow and instruction is designed to

promote frequent verbal responses from students. The teacher taught the children a response signal to ensure all students responded in unison to reduce the chances of students imitating other pupil's responses.

An ABABAB design was used to compare a fast and slow rate of teacher presentation. In the slow condition the teacher paused for 5 sec after a student response before introducing the next task. There was no pause in the fast condition. The slow condition was presented during phase A. The fast condition was presented during phase B. Teacher praise was held constant through both phases by reminding the teacher, through use of a tone played through an earphone every 90 s, to praise the students. Prior to the study, the classroom teacher was trained in both presentation rates. For the slow rate she was instructed to count to five silently after each student response. She was also instructed to follow the instructional lessons in the reading program manual exactly as written. The classroom teacher provided reading instruction for the first four phases. A student teacher observed the classroom teacher for three of the sessions and role-played the procedures. The student teacher provided instruction for the last AB phases.

Rate of presentation was measured by recording the total number of tasks presented and dividing by the total instructional time for the lesson. Three student behaviors were measured. Participation was recorded if a student subject responded within 1 second after the teacher's signal to answer. Answering correctly was recorded if the student responded with the appropriate academic response and was recorded even if the answer was given more than 1 second after the response signal. Off-task behavior was recorded for a variety of behaviors including leaving the instructional area, inappropriate talking, blurting out answers, crying, yelling, or other disruptive behaviors.

Data were collected on one subject at a time. One subject was rated for the first 10 tasks, the other for the next 10 tasks, and so on. A task began with an instruction, question, or demonstration by the teacher and ended when she initiated the next instruction, question, or demonstration. On average, each subject was rated for 30 tasks per lesson.

The mean number of seconds per task was 14.2 in the slow condition and 5.0 in the fast condition. The means for off-task behavior in the slow condition were 52.6% for Phase 1, 81.3% for Phase 3, and 75.3% for Phase 5. Means for the fast condition were 13.9%, 8.7%, and 4.5% for Phases 2, 4, and 6 respectively. The means for correct answers were 28.9%, 28.9%, and 26.6% for Phases 1, 3, and 5. In the fast condition, means for correct answers were 89.2%, 76.3%, and 76.0% for Phases 2, 4, and 6 respectively. Participation means for slow rate phases were 25.8%, 38.8%, and 29.1%. For fast rate phases participation means were 75.4%, 76.4%, and 79.3%. The mean agreement for reliability checks across all behaviors and both subjects was >90%.

In the first two phases, Student 2 had much higher means of participation and correct answers than Student 1 while their off-task behavior means were comparable (46.3% and 52.6%). However, in the second slow rate phase, Student 2's participation and correct answer means fell significantly from the previous two phases. Rate of presentation continued to affect Student 2 in a similar way to Student 1 for the duration of the study. That is, performance improved during fast rate instruction and deteriorated during slow rate instruction.

The results of this study suggest that a faster rate of instructional presentation may reduce off-task behavior and increase student rates of correct responding and

participation. The small number of participants limits the extent to which results can be generalized. The authors suggest a number of important ways to extend the study by including different presentation conditions, students with different abilities, and across different subject areas. Another important variable for future studies would be the effects of different presentation rates on larger group instruction.

In a systematic extension of Carnine's (1976) study, Tincani, Ernsbarger, Harrison, and Heward (2005) compared the effects of a long and short duration intertrial interval (ITI) on the participation rate, accuracy, and off-task behavior of prekindergarten students. Four typically developing, African American students participated in this study. The students were attending a summer program for students at-risk for academic failure. The program provided direct instruction in math, reading, and language. There were 25 students in total attending the program, which was co-taught by two special education teachers. The four student participants were selected for participation because their teachers reported that they engaged in high rates of off-task behavior during instruction.

Prior to the study both teachers received training in Direct Instruction procedures. Neither teacher had previous experience with Direct Instruction. The instructional material for the study was the *Language for Learning Presentation Book A*. Lessons 33 through 46 were used during the daily small group instructional sessions. Two groups of four students, each group containing two participants and two other children were observed. Students 1 and 2 received instruction from Teacher 1. Students 3 and 4 received instruction from Teacher 2. All sessions were conducted at the back of the general education classroom. The students sat with their backs to the rest of the class, facing the teacher.

Five dependent variables were measured: opportunities to respond, percentage of academic responses, academic responses per minute, correct responses per minute, and off-task behavior. Opportunities to respond measured the effects of teacher presentation rate on response opportunities. Opportunities to respond were measured with event recording on a data sheet. Data on academic responses were measured to determine the effects of different presentation rates on student participation. Student responses were measured with event recording on a data sheet. Percentage of academic responses was calculated by dividing the total number of responses by the number of opportunities to respond per session and multiplying by 100. Off-task behavior included all nonlesson related behavior, such as out-of-seat, nonlesson related talking, and touching other students. Off-task behavior was measured with a 5 seconds partial interval recording procedure and was scored from videotape after the instructional session was over.

An alternating treatment design was used to evaluate the effects of the slow and fast presentation rate on the dependent variables. Treatments were alternated randomly, with no more than two slow or fast treatments occurring consecutively. Two 5 minute sessions were conducted each day. The teachers used a self-cuing system to maintain the fast and slow presentation rates. In the fast condition, teachers counted "one one thousand" silently to maintain a short ITI. In the slow condition the teachers counted "one one thousand, two one thousand . . ." up to 5 seconds to maintain a long ITI. Teachers read the presentation script quickly in the fast condition and slowly in the slow condition.

During each lesson, the teacher followed the *Language for Learning* procedures in the presentation book. Students responded chorally to the teacher's questions when given a cue by the teacher. The one addition to the program's procedures was an error

correction procedure taught to both teachers during training. When a student made an error the teacher followed these procedures. First, the teacher modeled the correct response. Second, the teacher repeated the question and had the students say the correct response chorally with him or her. Third, the teacher repeated the question and gave the students the opportunity to make a correct response. If the students made two errors consecutively, the teacher moved on to the next item. The teacher also provided verbal praise when all students answered correctly.

Results indicated that faster teacher presentation increased students' participation and correct responding while decreasing off-task behavior. Data on teacher's rate of opportunities to respond demonstrated a significant difference between the conditions. In the slow condition Teacher 1 presented an average of 9.5 opportunities per minute and Teacher 2 presented an average of 9.3 per minute. In the fast condition, the mean rate of opportunities to respond was 17.8 per minute for Teacher 1 and 21.7 for Teacher 2.

Student behavior data were averaged across participants. The percentage of academic responses per minute was not significantly different with a mean of 79.6% (range, 69 to 95.7%) during the fast condition and 79.1% (range, 62.8 to 96.3%) during the slow condition. The mean number of responses per minute was significantly different between treatment conditions with 6.7 responses per minute (range, 5.2 to 8.2) in the fast condition and 2.9 responses per minute (range, 2.3 to 3.4) in the slow condition. A similar pattern of differences between the conditions was observed with the average correct responses per minute. In the fast condition the average number of correct responses per minute was 5.4 (range, 3.5 to 6.9) and in the slow condition it was 2.1 (range, 1.7 to 2.6).

Students engaged in fewer intervals of off-task behavior during the fast paced condition. The mean percentage of intervals per session with off-task behavior was 52% in the fast condition (range, 47.7 to 57.7%) and 74.4% (range, 66.7 to 80.9%) in the slow condition.

The results indicate that faster paced instruction allowed teachers to present almost twice as many opportunities for response than slow paced instruction. While participation rates were similar in both conditions, higher rates of opportunities to respond resulted in higher rates of student participation and higher rates of correct responding. These findings are important as they indicate that faster instructional pacing can lead to an increase in learning opportunities, response rates, and response accuracy.

In comparison, while the mean for off-task behavior intervals was lower in the faster condition, there was overlap in the ranges and considerable variability in the data. The researchers suggest that the lack of systematic behavior management procedures may account for this variability. This finding suggests that instructional techniques alone are not sufficient to address off-task behavior in the classroom.

A weakness of this study noted by the authors was that the procedures did not control for the effects of different talk rates by teachers even though teachers were instructed to speak at different rates in the two conditions. Faster talking, in addition to short ITI, would clearly allow for more opportunities to respond to be presented. The authors conclude that future research should examine the influence of talk rate on student responses.

In contrast to the findings of the above studies, Skinner, Smith, and McLean (1994) failed to find an effect on disruptive behavior when they compared immediate and 5

seconds intertrial interval (ITI) durations on the quality of learning trials with students with behavior disorders. Three elementary students from a private school for students with emotional/behavioral disorders participated in this study. Student 1 was 9 years, 2 months old. Student 2 was 11 years, 6 months old. Both had IQs of 70. Student 3 was 10 years, 10 months and had an IQ of 79. All three students were reading between the first and second grade level. All sessions were conducted in an observation beside the students' classroom.

Dolch words from the pre-primer through second grade lists were printed on index cards and used for intervention and assessment. A stopwatch was used to measure ITI and a tape recorder used to obtain permanent products of students reading. Students were awarded tokens that could be exchanged for stickers as reinforcement for their responses. Students sat across from the therapist at a table. The therapist instructed the student that he or she would have 3 seconds to read the words on the card. Words were then presented one at a time. No accuracy feedback was given. If a student did not read the word within 3 seconds the therapist presented the next work. Self-corrections were scored as accurate.

An adapted alternating treatments design was used to compare the effects of short and long duration ITI on students' rate of sight word mastery. Prior to intervention, students were assessed on the Dolch word list and unknown word lists were generated for each student. Any word that a student was able to read accurately prior to intervention was considered known and was removed from the unknown list. Pretreatment assessment identified 67 unknown words for Student 1, 97 for Student 2, and 94 for Student 3. Stratified random assignment was used to assign words to treatments for each student to ensure equal difficulty. Each student's word list was organized into levels based on word

difficulty. Seven words from the lowest levels were then assigned to each condition. After students mastered a word (i.e., read it correctly in three intervention sessions), it was moved to the mastered list and a new, unmastered word was added to the treatment word list.

During the immediate ITI intervention, the therapist randomly ordered seven index cards and told the students she was going to ask them to read some words. Students were also told that they would receive one token for each word read correctly. If the student did not read the word correctly, the therapist modeled the word and the student repeated the word. The student had three chances to read the word correctly and earn a token. The therapist presented the seven words three times. After the third set she recorded how many seconds it took to complete the entire session.

Procedures for the 5 seconds ITI intervention were identical to those above except that after each learning trial ended the therapist put the cards face down and waited 5 seconds before presenting the next word. When the word was read correctly, the trial was considered over when the token was awarded. When the word was read incorrectly, the trial was over after the student repeated the word modeled by the therapist. A stopwatch was used to time the 5 seconds interval. After both treatment sessions were completed students were allowed to exchange their tokens for stickers.

Each day, prior to beginning the first treatment session, students were assessed on the words for each condition and on their list of unmastered words that had not been assigned yet to a treatment condition. During these assessments, students were shown one word at a time on an index card and asked to read the word. If the student could not read the word accurately after 3 seconds the therapist presented the next word.

Six maintenance assessment sessions began one month after the last intervention day and were conducted at 1 week intervals. Treatment sessions continued as before. In addition, students were assessed on all mastered words every session. The therapist presented the words one at a time on an index card and asked students to read the word. Modeling and accuracy feedback was not provided during assessment. Reliability data were collected for 50% of the sessions. Agreement on words read correctly was 100% for all sessions except one where agreement was 98%.

Performance data for all three participants showed that the contingent modeling treatments were more effective than no treatment at increasing students' sight-word accuracy. All three students demonstrated steady improvement in the number of words read correctly for both pacing treatments and only slight improvements in the number of words read correctly for the untargeted words. The two pacing interventions did not produce significant differences in performance for Students 1 or 2. Both were equally effective.

Student 3 mastered more words during the 5 seconds ITI intervention than with immediate ITI. While a 5 seconds ITI was a more effective intervention for Student 3, the discrepancy between the number of words mastered in each treatment did not increase as the study progressed. Because visual analysis was inconclusive for Student 3, a repeated measures analysis of variance was conducted. The test showed a significant difference ($p < .01$) between the two treatments but an insignificant effect for the interaction between sessions and treatment.

The relatively high number of words read correctly during maintenance for all students demonstrates the durability of treatment effects. Also, Student 2's number of

words read correctly during the 5 seconds ITI condition increased steadily making it impossible to conclude which intervention resulted in superior retention for him.

Both immediate and 5 seconds ITI interventions effectively increased students' sight-word accuracy and those results were maintained over 10 weeks. While the interventions demonstrate equal effectiveness, the amount of time required to implement each teaching procedure would be different because in the 5 seconds ITI condition, the teacher is required to wait before introducing the next instructional trial, a procedure that lengthens the duration of the lesson. Therefore, because both were effective, the more efficient procedure (immediate ITI) may be preferable for classroom teachers with limited time available for instruction. Finally, the researchers anecdotally report a lack of disruptive behavior during treatment sessions despite high rates of disruptive behavior in the classroom. However, the combination of tangible reinforcers, individualized instruction, a segregated environment, and different instructional procedures make it impossible to determine how these variables influenced student behavior.

West and Sloane's (1986) early study explored a parallel question by examining the interaction between teacher presentation rate and schedules of reinforcement. Specifically, they examined the effects of the rate of academic response opportunities and point delivery on the disruptive behavior, performance accuracy, and student response rate in a classroom of five students with disruptive behavior. Two levels of each treatment variable were examined, a fast and slow presentation rate and a high and low point delivery rate. Five elementary students in a summer program for students with behavior disorders participated. Students ranged in age from 7.0 to 8.10 years. All

students performed below grade level and had been diagnosed with a behavior disorder. The same classroom teacher delivered all interventions for the students.

Four 15-minute treatment sessions were scheduled each day and occurred a minimum of 15 minutes apart. A different subject (e.g. reading, math, spelling) was used for each session and subjects were rotated through the different treatment conditions over the duration of the study. During the sessions, students sat facing the teacher and the observers sat behind the students. The experimental procedures were explained to the teacher but the purpose of the study was not explained. The observers knew nothing about the purpose or predicted outcomes of the study.

In the fast presentation condition the teacher presented a new task every 20 s. In the slow presentation condition a new task was presented every 60 s. The teacher was to deliver points every 60 seconds at the high delivery rate and only every 240 seconds at the slow delivery rate. These conditions were combined into four treatment conditions: fast presentation/high points (Condition I), fast presentation/low points (Condition II), slow presentation/high points (Condition III), and slow presentation/low points (Condition IV). A tone from a programmed tape recorder with earphones was used to prompt the teacher to praise students and deliver points for each condition. A stopwatch was used to cue the teacher on presentation rate. Points were awarded to individual students and they redeemed them during the reinforcement sessions in their regular classroom each day.

A multi-element design was used. In this design, the four combination conditions occurred once per day and the order of presentation was sequenced across days. The

sequence was constructed so that over the course of the study each condition was both followed by and preceded by every other condition to control for order effects.

The instructional materials for each subject were developed so that: (a) they required students to respond to a cue, (b) they required a written response, and (c) their rate of presentation could be altered by the teacher. The materials were also appropriate for small group use. Responses required by the students included circling the correct word in response to a picture cue, writing the answer to a math problem shown on a flashcard, and drawing in the clock hands on a blank clock face in response to the teacher saying a time of day.

Observational data were collected for all students simultaneously. Using a partial interval recording method, observers marked on a data sheet if any of the following student behaviors occurred: (a) distractions, (b) out-of-seat, (c) hitting others, (d) yelling, talking out, or making noises, or (e) throwing objects. Permanent products from the lessons were used to measure student accuracy in their written responses.

Mean points earned were divided by the number of minutes in the session to calculate a measure of the frequency of point delivery. The mean rates were 63.6 seconds for Condition I; 74.2 seconds for Condition II; 236.0 seconds for Condition III; and 254.8 seconds for Condition IV.

Teacher presentation rate was calculated by dividing the session length by the number of task presentations. The fixed session length and use of a stopwatch to cue presentations resulted in an exact match between the prescribed presentation rates and the actual presentation rates. The fast presentation conditions average 20 seconds per task and the slow conditions averaged 60 s.

Disruptive behavior by at least one student occurred in 55% of intervals during the fast presentation conditions and in 80% of intervals during the slow presentation conditions. The mean number of intervals in which disruptive behavior occurred in during fast presentation was 53% in Condition I and 57% in Condition III, in comparison to the slow conditions means of 76% in Condition II and 81% in Condition IV. The fast conditions produced less disruptive behavior. Point delivery rate did not produce a consistent effect on behavior.

The daily means for disruptive behavior were analyzed with the Friedman two-way analysis of variance (ANOVA) by ranks test. The ANOVA was significant beyond the .003 level ($\chi^2_{.0027,3} = 10.2$), which suggests the results are due to treatment effects of presentation rate.

Similar effects were observed with other student behavior. The mean percentage of intervals where distraction occurred was 6% for fast presentation and 13% for slow. Out-of-seat behavior occurred in 1% of fast and 2% of slow conditions. Although hitting occurred at low rates in all conditions, slow presentation generated 28 times more hitting events than fast presentation. Talking out occurred in 13% of intervals in the fast condition and 22% of intervals in the slow condition. The Friedman ANOVA demonstrates that there was a significant difference between treatment conditions for distractions, out-of-seat, hitting, and talking out ($\chi^2_{.0016,3} = 10.8$).

Group performance accuracy was 78% in Condition I, 88% in Condition II, 88% in Condition III, and 80% in Condition IV. The mean for the fast conditions was 79% and the mean for the slow conditions was 86%. No difference was found between means for high and low point delivery rates, 83% and 82% respectively. The group mean for

correct responses per minute was 2.49 in Condition I, .88 in Condition II, 2.38 in Condition III, and .85 in Condition IV. As above, differences were a result of the presentation rates and not due to point delivery rates.

This study provides additional support for Carnine's (1976) study that associated faster instructional pacing with lower rates of disruptive student behavior. A strength of this study is the use of observers who did not know the purpose or predicted outcomes of the study. Blind observers can increase objectivity and reduce the effects of expectancy on the data, thus improving the validity of the study. Although results support the authors expected outcomes, they also note that the multi-element design is capable of capturing effects of much smaller magnitude than a longer reversal design. In terms of the lack of effect found for the point delivery rates, the effect may be too small to be captured in the current study. Future research should examine the effects of these treatments over a more extended period of time.

The researchers claim that their intervention is an effective alternative for classroom teachers struggling to manage disruptive behavior. While their results indicate a clear treatment effect in experimental conditions, the rate of OTR in this study is very high. Additional research is required to assess how these procedures translate to the classroom and whether classroom teachers can implement them effectively.

Contingent Teacher Praise

Very little research has been conducted on the effects of contingent teacher praise in the general education classroom. The following studies, while older, were selected for review because general education teachers were used to implement the procedures for students in their regular classrooms, during typical instructional activities. Thee studies

are reviewed. Two studies focused on the effects of contingent teacher praise for specific students within a larger class. The third study measured the effects of contingent teacher praise on the attending behavior of the class as a whole.

Hall, Lund, and Jackson (1968) analyzed the effects of contingent teacher praise on the study behavior of students in general education classrooms. Two elementary teachers participated in the study. Teacher 1 was a first grade teacher. Teacher 2 was a third grade teacher. Both taught in an economically depressed area of a large city. Each teacher nominated students in their class who engaged in disruptive behaviors. Teachers were told that observers would be coming to the classroom to observe student behavior.

Four dependent variables were measured during observations, study behavior, non-study behavior, teacher verbalizations toward the target student, and teacher proximity to the target student. Study behavior included orientation towards the teacher and/or materials and participation in the lesson activity. Non-study behavior included all behaviors not appropriate during the lesson. Teacher proximity to the student was defined as the teacher being within 3 feet of the student. The observers used a data chart to record dependent variables using a 10 seconds partial interval recording procedure.

An ABAB design was used to evaluate the effects of contingent teacher attention on study behavior. During baseline, the observers sat at the back of the classroom and collected data on student and teacher behavior. Observations were 30 minute long and conducted daily. After a minimum of 2 weeks of baseline, student data were graphed and shared with teachers. Teachers were also given research articles on the reinforcing nature of social attention. Teachers then selected students for systematic study.

During intervention observations sessions continued at the same rate and duration as in baseline. When the observer noticed that the target student was engaged in appropriate study behavior, the observer cued the teacher by holding up a small square of colored paper in an unobtrusive manner. Upon seeing the cue the teacher moved over to the student and delivered contingent attention for study behavior.

After achieving a satisfactory rate of study behavior, the reinforcement was withdrawn by discontinuing the cuing system for the teacher. Teachers returned to their pre-study patterns of teaching. After the effects of the withdrawal had been observed, reinforcement was reinstated. Maintenance post-checks were conducted on some students when possible.

Between the two classrooms six students were selected for analysis of individual student behavior. With all students, visual analysis of their behavior data graphs indicates a clear treatment effect for contingent teacher attention. During baseline, the five students in the ABAB design engaged in study behavior an average of 25% of the intervals per session for Student 1, 30% for student 2, 37% for Student 3, 35% for Student 4, and 68% for Student 5. During the first intervention phase, their mean rate of study behavior increased to 71%, 71%, 71%, 73%, and 88% respectively. In reversal, the mean for studying behavior decreased to 50% for Student 1, 29% for Student 2, 37% for Student 3, 43% for Student 4, and 60% for Student 5. In the final intervention phase study behavior increased again to a mean of 79%, 72%, 70%, 73%, and 85% respectively.

Student 6 received a slightly different intervention and withdrawal sequence. In baseline he engaged in study behavior an average of 43% of intervals per session. During the first intervention phase his mean increased to 77% of intervals per session. In the first

reversal phase, Student 6 was given contingent attention and prompted to return to work when he engaged in non-study behavior. No attention was given for study behavior. In this phase his mean intervals of study behavior per session was 60%. At this point it became evident that his teacher was using the contingent attention behaviors across the school day, not just during the observations. A second reversal phase was implemented in which the teacher was instructed to only use the procedures during the observations. In this second reversal phase Student 6's study behavior dropped to 42% of intervals per session. In the second intervention phase, study behavior increased to 60% of intervals per session. Three checks made after the end of the study showed that study behavior continued at a rate of 70% of intervals per session.

One strength of this study was the use of general education teachers who had no prior knowledge of contingent attention procedures. Despite their lack of familiarity with this type of procedure they were able to learn to use the cues provided by the observers and deliver contingent attention correctly in a short period of time. A concomitant weakness with the procedures is the dependence of the teachers on a cue from the observer. Designing an intervention so that the teacher participant is dependent on an external cue makes it unlikely that the teacher will be able to continue to use the treatment with the same efficacy once the observer, and the cue, depart. Future studies should examine the ability of teachers to learn to monitor the appropriate behavior of target students in their classrooms and then deliver contingent praise. A procedure that promotes independence in the classroom teacher is more likely to be maintained and generalized outside of study conditions.

Hall, Panyan, Rabon, and Broden (1968) examined the effects of systematic reinforcement procedures on the study behavior of general education students. Three first year teachers participated in the study. None had any experience with systematic reinforcement procedures prior to the study. Teacher 1 taught sixth grade, Teacher 2 taught second grade, and Teacher 3 taught seven grade in a small town. All three had been nominated for participation by their principals due to the high rates of disruptive behavior in the classroom. Three separate withdrawal designs were used to assess the effects of the intervention in each teacher's classroom.

An ABAB design was used with Teacher 1. During baseline, behavior data were recorded for the first hour of each day using an interval recording procedure. Study and non-study student behavior was recorded. Study behavior was generally defined as orientation towards the teacher and/or materials and participation in the lesson activity. One student was observed at a time for each 10 seconds interval, with the observer rotating his observation consecutively among all students. If the student being observed engaged in any non-study behaviors (e.g., out of seat, talking inappropriately) then the interval was scored as non-study behavior. If no non-study behavior occurred, then the student's behavior at the end of the interval determined the rating for that interval.

Teacher verbalizations directed towards students were also recorded during baseline. Verbalizations were scored as positive if they followed appropriate study behavior and negative if they followed non-study behavior. During baseline, the mean class study rate was 44%. The teacher made positive comments for study behavior in an average of 1.4 intervals per session.

Prior to the first day of intervention, the classroom observer met with the teacher to discuss reinforcement principles and procedures. He was shown the graphs of baseline data on class study rates and his average number of positive statements. He was instructed to increase his verbal reinforcement for study behavior. After each day of the treatment phase, he was shown data on class study rates and his use of verbal reinforcement. During intervention, class study rate increased to a mean of 72%. The mean frequency of his verbal reinforcement increased to 14.6 per session.

In a brief return to baseline condition, feedback and instruction to the teacher was withdrawn. During this phase, the teacher provided very little reinforcement to his students. Study behavior subsequently decreased to baseline levels.

With the reinstatement of treatment, the class study rate mean increased to 76% and teacher verbal reinforcement increased to a mean of 14 per session. Over the last 10 sessions the teacher was instructed to stop providing verbal feedback for non-study behavior. However, this decrease did not affect class study behavior. Maintenance probes at 1, 3, and 5 months from the last day of intervention showed that high rates of class study and teacher attention for study behavior were maintained.

An ABB^2AB design was used with Teacher 2. The independent and dependent variables were implemented and measured in the same manner. Data were collected for the first 30 minutes of the morning reading lesson.

During baseline, the class study rate mean was 51%. The teacher made positive comments after study behavior in an average of 1.6 intervals per session. Prior to intervention, Teacher 2 was given the same information on reinforcement and instructed to increase her use of positive verbal reinforcement for study behavior. The mean

frequency of intervals in which the teacher gave positive reinforcement for study behavior increased to 9.0 per session and the class study rate mean increased to 62%.

Teacher 2 was not satisfied with this level of student engagement so "the study game" was introduced in a modified treatment phase. During this phase, reinforcement and data collection procedures remained the same. At the end of the 30 m reading period, the teacher selected the seven best "studiers" to lead a favorite game of the class. With the addition of the study game, the class study rate mean increased to 79%. After the teacher neglected to play the game for two days, the class study rate mean dropped to 50%. When the game was reinstated, the mean increased to earlier levels. Teacher attention data were not reported for this phase.

During a planned reversal when the study game was completely withdrawn, the class study rate mean dropped to 63%. Upon reintroduction of treatment procedures, the class study mean increased to 82%. The means for teacher reinforcement data were not reported for either of these phases, however visual analysis of the graphs indicated modest levels of reinforcement of study behavior occurred during the final treatment phase and zero levels during the withdrawal phase.

An ABB^2AB design was used with Teacher 3. Observations were conducted daily during the first 30 minutes of an afternoon session. Similar procedures as those used with Teacher 1 were followed, except that a 5 seconds interval was used to record student behavior. During baseline, the mean class study rate was 47%. The mean frequency for verbal reinforcement for study behavior was 6 intervals per session. The mean frequency for verbal reinforcement for non-study behavior was 20 intervals per session.

Prior to the first intervention session, Teacher 3 was given information on reinforcement and instructed to increase his use of verbal reinforcement for study behavior. Under these conditions the mean class study rate increased to 65%. Verbal reinforcement for study behavior increased to 9.0 intervals per session and for non-study behavior decreased to 9.0 intervals per session.

During the B^2 phase the teacher added a visual cue condition. Whenever a student disrupted the class he put a chalk mark on the chalkboard. For each mark, the class lost 10 seconds of their 5 minute break. If 24 marks were accumulated, then the break was cancelled. The teacher paused for 5 seconds after a disturbance before putting a mark on the board. If students stopped the disruption, no mark was made. During this condition the class study rate mean increased to 76%. During the reversal phases, the class study rate mean demonstrated a significant downward trend. When reinforcement procedures were reintroduced the class study rate mean increased to 81%. Mean frequencies for teacher reinforcement of study and non-study behavior were not reported. Visual analysis of the graphs indicates that reinforcement of study behavior decreased during withdrawal and increased again during the final treatment phase. Reinforcement of non-study behavior increased sharply in the middle of the withdrawal phase and dropped back to near zero levels during the final treatment phase.

Results for Teacher 1 support the claim that contingent teacher attention can increase desired student behavior. The reversal design was used to demonstrate the treatment effect at three points and the maintenance probes provide evidence of the durability of effects. The results from Teachers 2 and 3 demonstrate more modest increases with the use of contingent teacher attention on class study behavior. However, the introduction of

a second intervention for both teachers with an intervention phase to assess the impact of the new component alone (e.g., a study game only condition) reduces the internal validity of the results for these participants. Classroom teachers frequently use a variety of teaching and behavior management strategies.

In an extension of the previous literature, Broden and colleagues (1970) studied the effects of contingent teacher attention on the behavior of a pair of second grade students in a general education classroom. Their teacher had identified the two boys as the most disruptive students in the class. Student 1 had been retained in grade one due to poor behavior and academic performance. An assessment the previous year indicated he had an IQ of 60. Student 2 sat next to Student 1 in the classroom. An assessment determined an IQ of 72.

Observations were conducted every day during a 30 minute spelling and writing lesson. A 5 seconds time sampling recording procedure was used. Student 1 was observed for the first interval, Student 2 for the second interval, and so forth. Attending behavior was recorded at the end of each interval. Attending behaviors included looking at the teacher, looking at the appropriate page of a book if directed, and writing if directed to do so by the teacher. Non-attending behavior included being out of seat, talking with teacher permission, and all other behaviors incompatible with attending behavior.

An $AB^1B^2AB^3$ design was used to evaluate the effects of teacher attention. The mean of Student 1's attending behavior during baseline was 33% and the mean for Student 2 was 31%. Teacher attention for appropriate attending behavior occurred an average frequency of 1.4 and 2.6 for Students 1 and 2 respectively.

During the first intervention phase, the principles of positive reinforcement were explained to the teacher and research studies were presented. The teacher was instructed to attend to and praise only Student 2 when he engaged in attending behavior and to ignore his non-attending behavior. No change in her behavior towards Student 1 was implemented. However, upon implementation of these procedures an immediate change in Student 2's attending behavior resulted, with his mean attending for this phase increasing to 73% and up to a mean of 81% over the last 3 sessions of the phase. Teacher attention for appropriate behavior occurred an average of 7.9 intervals per session.

Initially, Student 1's behavior stayed at baseline levels but an increasing trend was evident, particularly towards the end of the phase. His mean for attending behavior over the whole phase was 47% and for the last sessions was 58%. Teacher attention for appropriate behavior for Student 2 occurred an average of 2.9 per session.

In the second treatment phase, the teacher was instructed to provide positive reinforcement for Student 1 and discontinue attention for Student 2. In this phase Student 1's mean for attending behavior increased to 82%. The mean for teacher attention for his appropriate behavior was 15.2 intervals per session. When positive reinforcement for attending behavior was discontinued, Student 2's mean dropped to 62% and teacher attention occurred an average of 1.6 intervals per session.

In the second baseline phase, the teacher was instructed to ignore attending behavior for both students. Teacher attention occurred 1.7 intervals per session for both students. Student 1's mean attending rate fell to 49% and Student 2's to 41%.

In the final treatment phase, the teacher was instructed to provide positive reinforcement to both students contingent upon attending behavior. Student 1's mean rate

of attending increased to 74% and Student 2's increased to 71%. Teacher attention occurred an average of 12.3 intervals per session for Student 1 and 11.3 intervals per session for Student 2.

Study results support the use of contingent attention as an effective method for increasing appropriate behavior and decreasing inappropriate behavior of disruptive students in a general education classroom. The results across the different phases of the study also suggest that attention directed at a neighboring student as well as teacher proximity can effect the behavior of students other than the one to whom the reinforcement is directed. Further examination into these conditions as they relate to teacher praise is necessary. The reversal design and the decrease in attending behavior during that reversal support a treatment effect. However, other variables that may have affected student behavior still require examination, including the effect of the modeling of appropriate behavior by the reinforced peer on the peer not receiving reinforcement.

A weakness of this study is the lack of direct measurement of student academic performance. Without these data it is impossible to determine whether an increase in attending behavior resulted in improved academic performance for the students.

Summary of the Literature Related to the Effects of Teacher Behaviors on Student Performance

Four studies on teacher presentation rate of opportunities to respond were reviewed. All of the studies used single subject research designs. Participants included typically developing students (Tincani et al., 2005), low achieving general education students (Carnine, 1976), and students with learning deficiencies and emotional and behavioral

disorders (Skinner et al., 1994; West & Sloane, 1986). Two studies evaluated the performance of students within a small instructional group that occurred within a general education classroom (Carnine, 1976; Tincani et al., 2005). One study examined the effects of teacher presentation rate in an analogue setting (Skinner et al., 1994). The fourth study included all the students in a segregated classroom of five students with EBD (West & Sloane, 1986). One study included other treatment variables for two participants, such as an activity reinforcer for one class and a class response cost procedure for another (Hall, Panyan, et al., 1968).

Three studies on the use of contingent teacher praise by general education teachers were reviewed. All studies were conducted in general education classrooms. One study used first year teachers struggling with classroom management as participants (Hall, Panyan, et al., 1968). The other studies included more experienced teachers. One study used a systematic observation system to evaluate student engagement of the whole class (Hall, Lund, et al., 1968). The other two studies identified target students with high rates of disruptive or off-task behavior for observation (Broden et al., 1970; Hall, Panyan, et al., 1968). Subsequent research on contingent teacher praise has not focused on disruptive student behavior within a general education setting.

Results from three of the studies indicate that greater numbers of opportunities to respond led to higher rates of student responding and increased learning (Carnine, 1976; Skinner et al., 1994; Tincani et al., 2005). However, results of the treatment for one study showed that a slower presentation condition, in which fewer opportunities to respond were presented, resulted in slightly higher performance accuracy (West & Sloane, 1986). The authors of three of the studies concluded that a more rapid presentation of

opportunities to respond resulted in decreased rates of disruptive behavior (Carnine, 1976; Tincani et al., 2005; West & Sloane, 1986). However, disruptive behavior only decreased, it was not eliminated. Skinner and colleagues did not find a decrease in disruptive behavior. This may be due to the fact that the participants in this study already exhibited very low rates of disruptive behavior.

After reviewing all of these studies it is evident that increasing the number of opportunities to respond was effective for increasing student engagement and learning rates and that that contingent teacher praise was effective for increasing appropriate attending behavior and decreasing inappropriate off-task behavior. To summarize, contingent teacher praise was demonstrated to be an effective procedures within the general education classroom to reduce disruptive behavior and increase attending behavior. The efficacy of high rates of opportunities to respond has been demonstrated in individual and small group instruction. Studies on the effects of teacher presentation rates in the general education classroom during whole group instruction were not found. Additionally, it is not evident whether these procedures would be effective in a general education classroom during large group instruction or whether teachers would be able to present OTR at a sufficiently high rate.

Review and Analysis of Performance Feedback to Improve Teacher Performance

A total of three studies were located that involved the investigation of the effects of performance feedback. Participants in these studies included inservice general education teachers and preservice teachers in the fields of special education and physical education. Five studies were located that involve the investigation of the effects of performance

feedback with goal setting on teacher performance. All five studies included preservice student teachers in special or physical education programs. Both groups of studies are discussed in this section of the literature review.

Effects of Performance Feedback on Teacher Behavior

Pierce and Miller (1994) compared the effectiveness of peer coaching to traditional faculty supervision on practicum students' acquisition of effective teaching behaviors. Twenty-nine special education practicum students enrolled in a mental retardation practicum participated in the study. All practicum students' completed their field-based teaching experience in self-contained classrooms for children with mental retardation at either an early childhood, elementary, or secondary school setting.

Prior to the study, a university supervisor was trained to use the observation forms and given a videotape of a lesson to practice scoring with the forms. The forms used in this study were adapted from the Florida Performance Measurement System (FPMS). The FPMS contains many different teaching behaviors, both effective and ineffective. For this study, the researchers selected an equal number of effective and ineffective teaching behaviors. The observation instrument listed 14 effective teaching behaviors (e.g., begins instruction promptly, gives specific praise, stops misconduct, maintains instructional momentum) and 14 ineffective teaching behaviors (e.g. allow talking unrelated to activity, uses non-specific praise, no evidence of lesson structure, delays desist or doesn't stop misconduct. Space was provided next to each behavior for the purpose of event recording. The practicum seminar was offered on two different nights. Students self-selected the section in which they would attend. The first group of 15 students served as the control group. The control group received traditional supervision and feedback. The

second group (i.e., treatment group) were 14 students who participated in peer coaching. All practicum students attended their field-based practicum for 4 hours per week in addition to the weekly 50 minute seminar.

Prior to baseline, the practicum students received a midterm and final evaluation form to give to their cooperating teachers. The items on this evaluation form were less specific than the observation instrument used by the supervisor. During baseline, the university supervisor observed students from both groups and collected data on effective and ineffective teaching behavior using the observation instrument. Observations were 20 minutes in duration. No feedback was given to student teachers during these baseline visits.

After baseline, the observation instrument modified from the FPMS and the general evaluation form were shared with all student teachers. The control group was told that the forms would be used in subsequent evaluations by the university supervisor. The experimental group participated in a 35 minute training session on the peer coaching procedures and then were assigned to peer coaching dyads or triads. Each coaching group also received training on using the FPMS observation instrument. Observation schedules were developed so that each practicum student had equal experience as the peer coach and as the coachee during feedback sessions. The practicum seminar was used for peer coaching conferences and support. In the control group, the seminar time was used to answer individual questions, provide lecture, and facilitate discussion on practicum. All practicum students in both groups identified target behaviors to improve during the seminar class.

Two peer observations were conducted for each participant in the experimental group. Observations were 20 minutes long and were followed by a coaching conference of the same duration. During observations, the peer coach would give the coachee a pre-determined signal to remind them to use the target behavior. The peer collected frequency data during the observation. During the peer coaching conferences, the coachee first self-evaluated the lesson, then the peer coach would discuss performance, and finally together they would determine new behaviors to target for improvement for the next observation.

The supervisor conducted two observations of each practicum student in the control group. These were scheduled approximately 3 weeks apart, were 20 minutes in duration and were followed by a post-observation conference of the same duration. Similar procedures were followed for the supervisor conference. First the student teacher self-evaluated the lesson, then the supervisor shared performance data, and lastly goals and strategies to improve performance were discussed.

This study used a 2 x 2 mixed model design with one between subjects factor (treatment) and one within subjects factor (performance over time). Data were analyzed with a multivariate analysis of variance (MANOVA) procedure. Results indicate that both feedback procedures were effective in improving student teacher performance. During baseline, the mean number of effective and ineffective teaching behaviors in the experimental group was 27.7 and 11.4, respectively. For the control group, the means were 25.2 and 10.0, respectively. After intervention, the experimental group improved their performance of effective behavior to a mean of 45.7 while the control group improved their performance to a mean of 45.2. Ineffective teaching behavior decreased to a mean of 7.4 for the experimental group and 7.9 for the control group. The MANOVA

found a significant difference between baseline and intervention for both groups, F (1, 26) = 12.26, p = .002. The interaction between treatment groups was not significant.

Each condition significantly improved student teacher performance. However, there are several variables that warrant further investigation. First, the peer coaches used a signal during observations to prompt their peer practicum students to engage in their target behaviors. It is possible that use of a prompt may have affected the student teacher's performance. The type and schedule of prompting should be studied to better determine the role they play in behavior change. Second, the factors that contributed to qualitative differences in the lesson plans of the experimental and control group should be identified and examined. The requisite skills or motivation for producing superior lesson plans could provide useful information on the different supervision needs of practicum students. Finally, only a small number of performance observations were conducted over one semester. The effects of peer and supervisor feedback should be examined with larger sample sizes, in different subject areas, and over a broad range of teaching competencies.

Smith and Steffen (1994) compared the effect of different schedules of feedback on student teachers use of four classroom management behaviors. Four student teachers were selected to participate in the 8-week study. Criteria for participation included evaluation ratings from previous field work, performance in previous physical education teacher education classes, recommendations from academic advisors, and previous teaching experience. Each student teacher taught in an elementary school in a rural school district. Classes ranged in size from 19 to 22 students. All lessons observed during this study were conducted in the morning and were 30 minutes in length.

The first author collected data for each participant four times per week during a 30 minute lesson. A computerized version of the Physical Education Teacher Assessment Instrument (PETAI) was used to record duration of teacher and student behavior. Duration measures were used to calculate the amount and percentage of time teachers engaged in instructional and managerial behavior and the amount and percentage of time that students spent in participation and managerial behavior.

Four AB designs were used in this study, with each student teacher receiving feedback on a different schedule for the treatment phase after a no-treatment baseline. Intervention began for all participants after the fifth lesson. The four feedback schedules were: (a) everyday, (b) every other day, (c) every four days, and (d) no feedback as a control. Feedback contained data on the amount and percentage of time each participant spent engaged in each of the four target behaviors: (a) beginning/ending class, (b) equipment management, (c) organization of pupils, and (d) behavior management.

Visual inspection was used to analyze the data and look for changes in level, variability, and trend. The percentage of lesson time for each managerial behavior was graphed. The three subjects who received feedback reduced the amount of time they spent on managerial behavior from 39.87% during baseline to 19.75% during intervention. The control subject increased the amount of time spent on managerial behavior over the duration of the study (baseline, 35.80% and intervention, 42.05%). Comparison of the data across the three treatment conditions demonstrates that the strongest treatment effect came from daily feedback. There was little difference between feedback every other day and feedback every four days. Student teachers in both conditions had similar means in baseline, 42.92% and 40.48%, respectively. Student

teachers who received feedback every other day reduced their mean to 35.14% during intervention. Those who received feedback every four days reduced their mean to 32.12%.

All four student teachers spent a low percentage of time beginning/ending class at the start of the study. The student teacher that received feedback every day evidenced a small decrease during intervention, from 2.87% to 1.85%. The student teachers with feedback every other day and every four days increased from 1.12% and 2.36% in baseline to 2.55% and 2.60% in intervention, respectively. The control participant demonstrated the greatest increase, from 1.73% in baseline to 3.27% in intervention. A similar result was found for equipment management. Only the student teacher receiving daily feedback decreased the amount of class time dedicated to this activity, from 2.52% in baseline to 1.45% in intervention.

All four student teachers decreased the amount of time spent organizing students during intervention. Daily feedback resulted in a halving of the amount of time spent on organization, from 20.43% in baseline to 10.79% in intervention. Decreases for less frequent feedback were less substantial. Feedback every other day reduced organization from 24.25% in baseline to 15.58% in intervention. Feedback every four days reduced it from 19.37% to 13.47% for baseline and intervention respectively. The student teacher receiving no feedback demonstrated the smallest change, from 19.17% in baseline to 15.11% in intervention. The magnitude of the behavior change increased as feedback frequency increased, with the student teacher receiving daily feedback exhibiting the greatest changes.

Behavior management data were the most variable across all participants and intervention data were inconclusive. The control participant increased the amount of time spent on behavior management (9.32% in baseline, 12.04% in intervention) as did the participant receiving feedback every other day (6.61% in baseline, 10.29% in intervention). The student teacher receiving daily feedback decreased the amount of time spent on behavior management from 5.88% in baseline to 3.83% in intervention. The student teacher receiving feedback every fourth day decreased her behavior management time slightly from 8.24% in baseline to 8.03% in intervention.

This study introduced the question of what feedback schedule is most effective for teachers. This was a new contribution to the literature on teacher feedback and the answer will help teacher educators develop student teacher competency. Unfortunately, the researchers' examination of the question is weakened by their experimental design. The lack of a reversal condition or use of a multiple baseline design makes it difficult to determine which behavior changes were a result of the intervention and which were due to other unidentified variables. Decreasing management time is an important component of effective education, though a low percentage of management time does not guarantee that students spend the balance of class time engaged in the subject matter. Future studies should use a more rigorous experimental design to evaluate the effectiveness of different schedules of feedback and should include measures of student engagement and performance. Additionally, the intervention should be evaluated with preservice and inservice teachers in different subject areas.

Mesa, Lewis-Palmer, and Reinke (2005) studied the effect of visual performance feedback on teachers' rate of praise for student performance. They also looked for

subsequent changes in student rates of problem behavior in relation to teacher praise. Two female elementary teachers who job-shared in the same second grade classroom participated in the study. These teachers were selected because they had requested assistance with classroom management. One teacher taught in the morning and the other teacher taught in the afternoon. Their general education classroom of 23 students was located in a small suburban school district.

A multiple baseline across participants was used to evaluate the effect of performance feedback on teacher praise. Data were collected for two behaviors. Disruptive student behavior included individual or group verbal or physical behaviors that disrupted academic instruction. Teacher praise was defined as verbal or physical teacher behaviors that indicated approval of students' academic or social behavior.

Observations were conducted daily. Teacher 1 was observed during explicit, teacher-led reading instruction. Teacher 2 was observed during explicit, teacher-led math instruction. The computer software program Multi-Option Observation System for Experimental Studies (MOOSES) was used to collect data. Performance feedback graphs were generated on Microsoft Excel® for daily analysis. During baseline, daily observations of both teachers were conducted. Data were collected but no performance feedback was given to the teachers.

During intervention, each teacher received simple line graphs depicting students' disruptive behavior and the teacher's use of praise. Graphs were given to teachers after every observation. Teachers were also given descriptive feedback on how to improve their performance and suggestions for the following day. The intervention lasted 14 days for the first teacher and 12 days for the second teacher. Six weeks after the end of

intervention, two maintenance observations were conducted. Teachers were not given any performance feedback during maintenance.

Teacher 1 increased her use of praise from a baseline rate per minute mean of 0.88 to an intervention rate per minute mean of 2.12. During maintenance, her rate per minute mean fell to 0.93. Teacher 2 increased her use of praise from a baseline rate per minute mean of 0.87 to an intervention mean rate per minute of 2.02. Teacher 2's mean rate per minute continued to increase to 3.62 during maintenance. For both teachers, student disruptive behavior decreased once teacher praise reached two-three praise statements per minute. When teacher praise occurred less than once per minute, disruptive behavior increased. This finding was maintained during maintenance for Teacher 2. When Teacher 1's praise mean rate fell during maintenance, student disruptive behavior increased. At the end of the study, each participant completed a social validity questionnaire. Both teachers found the intervention to be effective and reasonable. Both also agreed that it was a non-intrusive intervention.

The researchers acknowledge that this is a preliminary investigation into the effect of visual performance feedback on teachers' instructional practices. A strength of the study is that the same students were observed with both teachers. Thus, it is possible to observe the effect of different teachers on the same students. The different subject matter and the different times of day that observations were conducted introduced some uncontrolled variability and limit the degree to which results can be generalized. The job sharing relationship of the teachers would have made it difficult to counterbalance these variables. Future research should examine the effects of visual performance feedback on

a larger number of participants, on a variety of effective instructional practices, and should examine the variables required to make behavior change durable over time.

Effects of Performance Feedback with Goal Setting on Teacher Behavior

In an extension of the literature on performance feedback with teachers, Brawdy and Byra (1995) used a multiple treatment reversal design to compare the effectiveness of two supervisory models, self-assessment supervision and collaborative supervision, on physical education student teachers' use of verbal feedback statements. Three types of statements were studied. Positive specific statements communicated approval for a specific behavior. Positive general communicated non-specific approval, for example "Good job." Corrective specific feedback communicated specific information on a required behavior change. Sixteen student teachers in their first field experience participated in the study. The student teachers instructed the same preschool child twice a week for six weeks for a total of 12 lessons. The lessons focused on fundamental motor skills such as catching, kicking, and throwing.

The ABAB design study included four phases. Phase 1, Baseline One, included lessons one through three. A 10 minute segment of each lesson was videotaped. The student teachers taught a lesson and received no feedback. The authors coded the videotapes to determine the type and frequency of teacher statements. These were converted into a rate per minute score for each lesson. An average rate per minute for positive specific feedback for the first three lessons was calculated for all 16 participants. These scores were paired for similarity. One participant from each pair was then assigned to the self-assessment supervision treatment while the other was assigned to the collaborative supervision treatment.

Phase 2, Intervention One, included lessons four through six. Immediately after each lesson, participants in the self-assessment supervision condition were required to: (a) view and code their lesson videotape, (b) calculate a rate per minute for each type of feedback, (c) graph their scores, and (d) develop a teaching goal for the next lesson based on the data. Participants in the collaborative supervision condition were required to conference with a supervisor after each lesson and: (a) identify strengths and weaknesses of the lesson, (b) jointly view and code the videotape with their supervisor, (c) calculate and graph rate per minute scores for each category, (d) discuss a strategy for improvement, and (e) develop a teaching goal for the next lesson based on the data.

Phase 3, Baseline Two, included lessons seven through nine. No supervision or feedback was given to any of the participants during this phase. Phase 4, Intervention Two, included lessons 10 through 12 and consisted of reversing the treatment received by participants. Those receiving the collaborative supervision treatment before now received the self-assessment supervision and vice versa.

Frequencies for each type of feedback were calculated for each lesson and converted in a rate per minute by dividing the total number of feedback statements by the total number of minutes in the lesson. For positive specific feedback, the mean rate-per-minute in Baseline One ranged between 0.40 and 0.60. During the first intervention phase, those receiving collaborative supervision increased their rate-per-minute to 1.0. Those receiving self-assessment supervision remained near baseline levels. During the second baseline, the rate-per-minute for the collaborative supervision group initially increased to 1.5 but then decreased to less than 1.0. The self-assessment group increased to over 1.0 during the second baseline lessons. In the second intervention, the rate-per-minute scores

for the group now receiving self-assessment supervision leveled out at 1.0 while the group now receiving collaborative supervision steadily increased across all three final lessons to 1.77.

For positive general feedback the mean rate-per-minute in Baseline One ranged between 1.36 and 2.22. During the first intervention phase, those receiving collaborative supervision maintained a rate-per-minute of less than 2.0. Those receiving self-assessment supervision averaged a rate-per-minute greater than 2.0. During the second baseline, the rate-per-minute for the collaborative supervision group increased to 2.0. The self-assessment group remained consistent with scores from the first intervention phase. In the second intervention, the rate-per-minute scores for the group now receiving self-assessment supervision ranged between 1.93 and 2.94 while the group now receiving collaborative supervision ranged between 2.25 and 2.57.

Very little between- and within-group variance was found for corrective specific feedback in all phases. For the group receiving self-assessment supervision first, corrective specific feedback rate-per-minute scores ranged from 0.33 and 0.74. For the group receiving collaborative supervision first, scores ranged from 0.22 to 0.71. Interobserver agreement (IOA) data were collected for a total of 21% of the lessons. Mean IOA scores were 93% for positive specific, 90% for positive general, and 82% for corrective specific.

The researchers conclude that the both supervision models can be used to modify student teachers' frequency of positive specific feedback statements while results for positive general feedback were less conclusive. A more sustained increase in positive specific feedback was observed in participants who received collaborative supervision in

the second intervention phase. The authors accurately identify the possibility of order effects as potentially confounding their results. Another limitation of this study is the lack of a true baseline condition to determine how student teachers' behavior changes without supervision. Future researchers should examine separate groups of student teachers to evaluate the effect of these two interventions in comparison to no intervention.

Miller, Pierce, and Jones (1995) examined the effects of self-determined, data-determined, and supervisor-determined goals on student teacher behavior. The purpose of this study was to determine if one of the three goal setting procedures was more effective for developing and improving teaching skills.

Thirty-one special education student teachers participated, six males and 25 females. Two females were African American, one female was from India and the remaining participants were Caucasian. Four of the student teachers were in a master of education program and 27 were in a Bachelor of Science program. They were all novice teachers earning their initial teaching license. Each participant was assigned to an elementary special education classroom in a large urban district for his or her student teaching semester.

Data were collected using two instruments. The first instrument was the Florida Performance Measurement System (FPMS). The second instrument was an informal researcher-constructed goal-setting form. The goal setting form was used to record six goals; three teacher behaviors to maintain and three teacher behaviors to increase. Beside each goal was a space for frequency tallies to be recorded during classroom observations.

A university supervisor conducted an initial classroom observation of each participant. For 20 min, the supervisor recorded event frequency data on effective and

ineffective teaching behaviors. After the 20 minute data collection session, the supervisor spent a few more minutes making general anecdotal notes on the student teacher's performance in general.

Immediately after the lesson, the supervisor and student teacher met for a one-hour conference. The supervisor began the conference with a non-specific positive comment. Next, the supervisor introduced the goal setting form and explained how it would be used. The student teacher was asked to identify two goals, a teacher behavior to maintain and one to increase. After this, the supervisor shared the FPMS data and used that information to generate two more goals. Then the supervisor generated the last two goals. A copy of the goal setting form was given to the student teacher. After the goal setting, the supervisor shared her anecdotal observations and answered questions. Finally, the supervisor informed the student teacher that a graduate assistant would conduct a follow-up observation and conference based on the six goals.

Two weeks later, the graduate assistant conducted a follow-up observation and during the post observation conference, gave the student teacher feedback on the data collected related to each goal behavior. This cycle was then repeated once again during the semester. The supervisor observed the student teachers using the FPMS and would set goals with the participant. Then the graduate assistant would conduct a follow-up observation. A total of four observations and conferences were conducted with each participant.

Data were analyzed using a multivariate analysis of variance using a repeated measures design with the three different goal types as the dependent variables. Responses that required participants to maintain behavior (M=6.41) occurred at a significantly

higher rate than responses that required increases in behavior (M=3.75; $F_{1,28} = 42.35, p <$ .001). After a multivariate adjustment, there was a significant difference among outcomes based on goal types: self-determined (M=4.51), data-determined (M=5.93), and supervisor-determined (M=4.80; $F_{1.95, 54.49} = 3.76, p < .05$). A post-hoc comparison using the Scheffé test determined that only the difference between self-determined and data-determined goals was significant ($p < .05$). Additionally, there was a significant interaction ($F_{2, 56}$= 8.37, $p < .001$) between the maintain-increase dependent variable and the dependent variable for goal type. These results indicate that while teaching behavior associated with the maintaining goals occurred more frequently than behavior associated with the increasing goals, the data-based maintaining behaviors increased significantly more than maintaining behavior for the other two goal types.

Although participants attended to all goals, regardless of how they were derived, data-based goals had the greatest impact on behavior change, indicating that objective data appeared important to the student teachers. While there was not a significant difference on behaviors to increase based on goal type, this may have been because it is more difficult to increase behavior than maintain existing behavior performance.

The preceding studies are the first two investigations of performance feedback with goal setting on teachers (Brawdy & Byra, 1995; Miller et al., 1995). The researchers conclude that more research is required to examine the lack of effect related to goal setting and increasing teacher behaviors, the potential impact of more frequent observations, and the influence of task difficulty on student teacher performance. One limitation of the Miller et al. study is the small number of observation and conferences conducted for each participant. Behavior change is often a lengthy process and future

studies should examine the durability of the effects of this intervention. Finally, the anecdotal comments made by observers to the student teacher are not clearly defined. These may have had an influence on student teacher behavior and should be more carefully examined in further research.

In the first of a series of studies investigating the use of data-based performance feedback on the performance of physical education student teachers, Sharpe, Lounsberry, and Bahls (1997) examined the use of performance feedback on the performance of undergraduate student teachers. Four physical education student teachers participated, two male and two female. Each participant was dual-certified in elementary and secondary physical education and had completed a methods course in the semester prior to the study. During the methods course, student teachers were taught classroom instruction, behavior management, recommended teaching procedures and the concepts of sequential behavior analysis. The practicum used for observation in the study was their first experience with teaching field work. All sessions were conducted in the secondary physical education classes to which each participant was assigned.

Two dependent variables were measured, Occasions for Appropriate Action (OAA) and Pupil Behavior Change. OAA was defined as an opportunity for the student teacher to respond to instructional or managerial pupil behavior. Examples of OAA include a pupil struggling to perform a skill or a pupil engaging in off-task behavior. Both OAA and instances where the student teacher took appropriate action were recorded.

Pupil Behavior Change measures included percentage of pupil time spent on activity engagement, organization, and off-task activities. One pupil from each participant's class was selected as the target pupil. The pupil with the lowest engagement and highest off-

task activity was selected. Student teacher participants were unaware of which pupil had been selected.

A multiple baseline design across participants was used. During their practice teaching practicum, the performance feedback procedures were used with each student teacher. Participants were required to plan and teach one lesson per week for observation. A university supervisor observed the lessons and collected data on the dependent variables. During baseline, participants received general, qualitative feedback related to their performance on a 15-item Likert scale on teaching behavior discussed during the methods class. Feedback was given for general teaching behavior such as having a well-organized classroom. Feedback was given in a 15 minute session once a week with the student teacher, university supervisor, and cooperating classroom teacher. The authors structured the baseline condition to mimic traditional student teaching performance feedback.

During intervention, student teachers continued to teach one observed lesson per week and feedback was given immediately afterwards. Performance feedback included providing student teachers with data on the number of OAA, number of OAAs they responded to appropriately, and the percentage of class time the target pupil was appropriately engaged and off-task.

During the maintenance condition, student teachers switched to a different practicum setting where they continued to teach. Their performance was observed and measured once a week but they received no feedback.

All four student teacher participants improved their appropriate action when performance feedback was implemented. In baseline, all student teachers were

responding appropriately to low percentage of OAA. During intervention, student teacher appropriate responses increased to correlate with a majority of the OAA that occurred within a lesson. Data were presented graphically, no means were given for conditions.

Pupil behavior also changed as a result of the intervention. Baseline data for each target student showed similar percentages of time spent on off-task behavior, organization, and activity engagement. During intervention, activity engagement for all target pupils increased dramatically while the percentage of time spent on organization and off-task behavior decreased, eventually to less than 10% of class time. These behavior changes were sustained for the majority of the intervention phase and through the maintenance phase.

Social validity questionnaires were administered at the end of the study. The cooperating teachers found the system manageable and beneficial. Student teachers reported that despite initial uncertainty, in the end they liked the performance feedback system and felt it helped them improve their teaching.

This study provides additional support for performance feedback as an effective feedback strategy. Two methodological issues in the current study indicate the need for caution when interpreting results. First, the manner in which feedback was provided to student teachers is unclear. The authors state that data represented teacher and pupil performance in detail, but whether the data were detailed in graphs, tables, or narrative is unclear. This is important because one of the hypotheses posited by the authors is that their procedure is more effective than the traditional anecdotal note system. It is therefore necessary for the types of feedback to be clearly distinguished.

The second issue involves the pupil behavior change data during the maintenance phase. During this phase, the student teachers switched to a new cooperating teacher and to "a similar group of pupils" (Sharpe et al., 1997). This description appears to indicate a new group of pupils with similar characteristics but not the same group of students as in the previous phases. If that is the case, then the target pupil is possibly a different child and the pupil behavior change data should not be represented as continuous behavior. At a minimum, the authors should provide more clarification on the setting and pupil composition of the maintenance phase.

Sharpe, Hastie, and Savage (1998) extended the work of Sharpe et al. (1997) on the use of performance feedback to help student teachers monitor and adjust their interactions with students. Participants were four undergraduate physical education major student teachers, two male and two female, beginning their first full-time practice teaching semester. All were placed in middle schools in the same urban district.

The primary dependent variable was occasions for appropriate action (OAA), defined as situations in which students were having difficulty with the subject matter or skills to be learned or were having difficulty determining how to be successful (Sharpe et al., 1998). The cooperating teacher observed each class taught by the student teacher and recorded the number OAAs and the number of those situations when the student teacher used a recommended instructional strategy to address the OAA. Recommended instructional strategies were taken from the required physical education methodology course in which all participants were enrolled.

The second dependent variable was pupil behavior. Pupil behavior was calculated as the percentage of time the student spent engaged in lesson activities, organization

activities (i.e., deciding what to do), or off-task behavior. Pupil behavior was recorded for one target student with challenging behavior for each class. The participant was unaware of which student had been selected for observation.

A multiple-baseline across participants design was used to evaluate the effects of qualitative feedback only, performance feedback, and short-term maintenance after exposure to both conditions. During the first condition, baseline, student teachers received general qualitative feedback from a university teacher educator once per week. Qualitative feedback rated teaching performance on a 15-point Likert scale and addressed general teaching behavior such as providing materials in a timely manner. This condition was intended to reflect the typical feedback provided to student teachers.

In the second condition, introduced in stepwise manner to each participant, student teachers received performance feedback once per week in a conference with the cooperating teacher and university teacher educator. During the performance feedback session, (a) each person gave their general view of the lesson just taught, (b) the teacher educator then presented the data on OAA, teacher responses, and pupil behavior, and (c), one to three goals were set by the triad to address the most significant problems represented in the data.

Baseline data indicate that qualitative feedback alone did not result in frequent use of recommended teaching practices across all participants. During the performance feedback phase, student teachers use of recommended teaching practices increased rapidly. In the maintenance phase, each student teacher was able to maintain their improved performance without receiving any feedback.

Baseline data for pupil behavior showed that the target student spent a large portion of each baseline lesson engaged in off-task behavior or in organization activities. A low percentage of time was spent engaged in subject matter activities. Once performance feedback was implemented, activity engagement doubled for each target student and organizational and off-task behavior decreased significantly. These changes in pupil behavior persisted during the maintenance phase even though the students were paired with a different student teacher participant.

Results of this study indicate that performance feedback is more effective than general qualitative feedback at increasing student teachers' use of recommended teaching practices. Further study is required to determine the effectiveness of this intervention with student teachers in other subject areas, the optimal number of feedback sessions, and the long-term durability of teacher behavior change.

The primary strength of this study was the comparison of qualitative and data-based feedback. Teacher education programs traditionally use qualitative feedback with student teachers and it is important to know if a more effective method is available. Unfortunately, the benefit of this strength is limited by the lack of a true baseline (i.e., a phase during which no feedback was provided). The effect of qualitative feedback cannot be determined unless it is compared to a true baseline phase. Another weakness of this study is that the procedures and data collection methods are unclear, making it difficult to determine exactly how data were collected, analyzed, and presented to participants.

The third study in this line of research was conducted by Sharpe, So, Mavi, and Brown (2002). They examined the effectiveness of performance feedback with goal setting across different practice-teaching environments and supervisory conditions. Four

undergraduate physical education specialist student teachers participated in the study. Participants were juniors in university, between 20 and 22 years of age, with a mean GPA of 3.4 (range 3.2-3.6). Two university supervisors, trained in sequential behavior analysis, provided feedback to the student teachers. Two cooperating teachers were also trained to participate in the feedback and goal setting procedures.

The setting for the school-based teaching was the gymnasium in a professional development, suburban middle school. There were approximately 25 students per class with a nearly equal gender mix and a diverse range of skill levels and ethnic groups represented. Each lesson lasted approximately 45 minutes and was observed for the entire period by the university supervisor and cooperating teacher. Observations consisted of a 5 to 10 minute discussion of teaching practices prior to the lesson, observation and data collection during the lesson, and a 10 to 15 minute discussion after the lesson during which behavior data were discussed and goals were set to improve student teacher performance on target behavior.

The setting for the peer-teaching was a gymnasium in a university laboratory. Twenty-five undergraduate peers played the role of middle school students. Student teachers structured their lessons in the same manner as in the school-based experience and the form and manner of observation by the supervisors was the same.

Target behaviors were observed for student teachers and their students. Teacher behavior included the number and percent of class time the teacher spent on instruction, interpersonal exchanges, organization, and instruct/observe/feedback behavior sequences. Student target behaviors were the amount of class time students spent engaged with the subject matter, waiting or engaged in organizational activities, or off-task. In addition to

these behavior data, student teacher self-reports were collected at the end of the study to evaluate the social validity of the interventions. This was collected using a questionnaire that included open- and closed-ended questions. The questionnaire had been tested with undergraduate students independent of this study and was found to have acceptable levels of construct validity (Pearson $r = .84$) and test-retest reliability (Cronbach $\alpha = 89$).

Each participant was observed 12 times per semester over two consecutive semesters for a total of 24 observation sessions. A trained graduate assistant collected behavioral data using a laptop computer and behavior observation software. By pressing and holding different alphanumeric keys, the graduate assistant recorded the occurrence and duration of multiple behaviors simultaneously. Data were recorded continuously for the 45 minute lesson. After each observation, the graduate assistant used the software to calculate the number and percentage data for each target behavior.

An A-B-A-C multiple baseline design with treatment reversal across participants was used. The A condition was baseline, during which data were collected for each participant and no feedback was given. The B condition was school-based field teaching. During this condition, the university supervisor and the cooperating teacher met with the student teacher once per week to review the data and set goals for improved performance based on the performance feedback data. Feedback and goal setting sessions lasted approximately 15 minutes and occurred immediately after the observed lesson. The C condition was peer-based practice teaching. During this condition, only the university supervisor conducted feedback and goal setting in a manner consistent with the procedures for the school-based setting. The phase sequence for the participants was as

follows. Participant 1 received A-B-A-C-A. Participant 2 received A-C-A-B-A. Participant 3 received A-B-A. Participant 4 received A-C-A.

Behavior data shows a rapid increase in all target teacher behaviors in the school-based phase (B) and a limited improvement in target teacher behaviors in the peer-teaching phase (C). Additionally, gains made during the school-based phase maintained for the duration of the study though there was a small decrease in the number and frequency of interpersonal exchanges than with the other teacher behaviors. The modest gains made during the peer-teaching phase were not maintained and returned to baseline levels during maintenance.

Results for student behavior data reveal a similar trend. During the school-based feedback phase, there was a rapid increase in subject matter engagement and a decrease in the amount of time spent in organization or waiting and off-task behavior. These improvements were also maintained across subsequent phases and during maintenance. Likewise, a very small improvement to subject matter engagement was evident during the peer-based phase and organization and off-task behavior remained near baseline levels. This improvement was not durable and behavior returned to baseline levels.

This study addresses some of the methodological issues in previous studies by including a true baseline phase and providing more details on intervention procedures. Also, order effects are limited by counterbalancing the sequence in which Participants 1 and 2 received the different interventions. Finally, by including additional participants who receive only one intervention each, the isolated impact of each intervention is more evident. One limitation of this study is that long-term maintenance data are only provided for the two participants who received a single intervention. The final baseline phase for

the participants receiving both interventions is much shorter. Future research should expand study of sequential behavior analysis and goal setting by including more participants across different subjects, and across elementary and high school settings.

Summary of Literature Related to the Use of Feedback to Improve Teacher Performance

A total of eight studies were reviewed in the previous section, five on performance feedback with goal setting and three on performance feedback alone. Seven used single subject designs and one used an experimental group design (Miller et al., 1995). All studies used data from direct observation to provide feedback on teaching performance. One study included inservice elementary teachers who job shared in a general education classroom (Mesa, et al., 2005). The others included student teachers in special education (Brawdy & Byra, 1995; Pierce & Miller, 1994; Pierce, Miller, & Jones, 1995) and physical education practica (Sharpe et al., 1998; Sharpe et al., 1997; Sharpe et al., 2002; Smith & Steffen, 1994).

Four of the studies provided student teachers with visual representations of the observation data, such as graphs or frequency counts (Brawdy & Byra, 1995; Sharpe et al., 1998; Sharpe et al., 1997; Sharpe et al., 2002). One study evaluated different sources of goals and determined that data-based goals produced the most significant behavior change in teachers (Miller et al., 1995).

Results from all studies showed that data-based performance feedback was effective for improving student teacher performance. In particular, authors of three studies found specific performance feedback more effective than the general, qualitative feedback that

was similar to the traditional model used in teacher preparation programs (Sharpe et al., 1998; Sharpe et al., 1997; Sharpe et al., 2002).

Performance feedback was most effective when given on a daily basis (Smith & Steffen, 1994). Both supervisors and peers were effectual agents for providing feedback. Two studies also provided feedback on positive changes in pupil behavior as a result of changes in teacher performance (Mesa, et al., 2005; Smith & Steffen, 1994). Based on the results of these studies, data based performance feedback with goal setting appears to be successful at improving the instructional performance of both inservice and preservice teachers.

Summary of Literature Review

Based on this review, feedback and goal setting appear to be an effective method for improving the performance of student teachers. Feedback alone was also effective during intervention, however, the paucity of maintenance data for these studies means that the durability of the behavior change is unknown. Conversely, maintenance data for performance feedback plus goal setting indicates that teacher behavior change is maintained after feedback is discontinued (Sharpe et al., 1998; Sharpe et al., 1997; Sharpe et al., 2002). Unfortunately, only one study applied this intervention to inservice teachers (Mesa et al., 2005), though methodological issues of this preliminary investigation limit the extent to which its results can be generalized.

The review of the literature on select teaching behavior highlight two effective strategies that teachers can use to increase learning and improve student behavior in the classroom. Increasing the number of opportunities to respond was demonstrated to be an

effective method for increasing student engagement and learning rates (Carnine, 1976; Skinner et al., 1994). Additionally, two groups of researchers found that an increase in the rate of opportunities to respond corresponded with a decrease in disruptive behavior (Carnine, 1976; West & Sloane, 1986). Only one of these studies was conducted in a general education classroom, and even this study focused on small group instruction within the larger classroom (Carnine, 1976). More research on the effects of opportunities to respond in a general education classrooms is warranted.

The literature related to the use of teacher praise and its effect on student behavior also was reviewed. These studies were conducted in general education classrooms. Verbal positive reinforcement for desired student behavior was effective at increasing appropriate behavior and decreasing inappropriate behavior (Broden et al., 1970; Hall, Lund, et al., 1968; Hall, Panyan, et al., 1968). One benefit established by these studies was that general education teachers with no prior knowledge of reinforcement principles could quickly and easily master correct application.

The results of this review of the literature lead to the following conclusions. First, teacher praise and increased opportunities to respond have been identified as effective strategies for increasing learning and improving student behavior. Second, performance feedback with goal setting is an effective procedure for improving teacher performance. However, this procedure has not been adequately examined with inservice teachers. Third, general education teachers can learn and apply teaching strategies more commonly associated with special education but little cross-over research has been conducted. Based on these conclusions it is evident that more research is required to assess the efficacy of these methods in general education classrooms with inservice teachers. Specifically,

studies are needed to evaluate the effectiveness of performance feedback with goal setting on general education teachers' use of praise and opportunities to respond.

CHAPTER 3

METHOD

The purpose of this study was to examine the effectiveness of performance feedback with goal setting on classroom teachers' use of effective teaching behavior and to subsequently examine the impact that changes in teacher behavior have on student behavior. This chapter contains a detailed description of study procedures. First the participants and setting are described. Next, the data collection procedures and instruments are explained. Then, the procedures for each phase are detailed, followed by interobserver agreement and treatment integrity data. Finally, a description of the analysis used for each research question is provided.

Research Questions

1. Does training teachers to read performance feedback graphs and engage in goal-setting increase their rate of opportunities for student responses?
2. Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of academic praise and corrective feedback?
3. Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of behavioral praise and corrective feedback?

4. Are teachers who receive performance feedback graphs and engage in goal-setting able to achieve and maintain a ratio of 4:1 praise to corrective statements?
5. To what extent does increasing the teacher's rates of target behavior result in an increase of students' percentage of correct academic responses?
6. To what extent does increasing the teacher's rates of target behavior result in a decrease of students' rates of disruptive behavior?
7. To what extent are the teacher participants satisfied with the contextual fit of the goals, outcomes, and procedures of the intervention?
8. To what extent do teacher participants feel better prepared to meet the needs of students with challenging behavior in their classrooms?

Participants

Participants for this study were recruited from the faculty of a large urban middle school. The school administrator agreed to assist with participant identification and recruitment. The initial criteria for selection to participate in this study were: (a) the teacher had a high rate of office discipline referrals for his or her students, (b) the teacher had requested additional support related to classroom management issues during the current school year, or (c) the school administrator identified the teacher as needing additional classroom management support. Based on these criteria, the administrator identified a list of four teachers. The administrator contacted each teacher and offered the opportunity to participate. Of the four original teachers, two agreed to participate. Criteria were then expanded to include teacher interest in learning about the intervention and

improving classroom behavior and the school's PBS team was informed of the study and assisted with recruitment. Based on the new criteria, two additional teachers on the team agreed to participate.

Table 1 displays the demographic data for each participant. Demographic data was obtained through teacher self-report. Teachers 1, 3, and 4 were female. Teacher 2 was male. Teacher 1 was a new teacher in her first year out of college. Teacher 2 and Teacher 3 were both experienced teachers who had been at the school for more than 4 years. Teacher 4 was also an experienced teacher. This was his first year at this school, having moved from another state. Two of the participating classrooms, Teacher 1's was comprised of students with Limited English Proficiency (LEP), as well as students on Individualized Education Programs (IEP). Teacher 4, included students on IEPs and students with LEP along with general education students. These students did not receive any services during the observation session. Their services occurred at other times of the day within a cooperative consultation model. Teacher 2 and Teacher 4 had students with LEP along with general education students. The fourth classroom, Teacher 3, did not include any students formally identified with disabilities or LEP, though the teacher indicated that at least two students had unidentified needs.

Setting

This study was conducted at a large urban middle school in a large school district in the Southwestern United States. According to the district accountability report, in the 2004-2005 school year, the school enrolled 1400 students in 6th through 8th grade. See

Table 1

Teacher Demographics

	Grade	Subject	Years Experience	Degree	Classes in Behavior Management	Classes in Special Education
Teacher 1	6	Life Science	0.5	B.A.	1	1
Teacher 2	8	Math	34	M.A. +80	3	3
Teacher 3	7	English	15	M.A. +10	4	1
Teacher 4	7	Reading	12	M.A. +30	0	1

Table 2 for a display of student demographic information. Located in a low economic area of the city, the school's transiency rate in 2004-2005 was 41.5% as compared to a district average of 37.0%. The school has a diverse population, a majority of the students are Hispanic, 48.8% are designated as having Limited English Proficiency, and 100% of the students qualify for the free and reduced lunch program. See Table 2 for a summary of school demographics and Table 3 for the student demographics for the classrooms of each teacher participant.

Table 2

Student Demographics, Whole School (2004-2005)

Students	Enrollment (%)	Avg. Daily Attendance	Retention
Total	1400 (100%)	95.7%	3.5%
American/Indian Alaskan Native	15 (1.1%)	N/P	N/P
Asian/Pacific Islander	33 (2.4%)	N/P	N/P
Hispanic	936 (67.1%)	N/P	N/P
Black/African American	236 (16.9%)	N/P	N/P
White	177 (12.6%)	N/P	N/P
IEP	192 (13.7%)	N/P	N/P
LEP	673 (48.1%)	N/P	N/P
RFL	1400 (100%)	N/P	N/P

Note. IEP = Students on Individualized Education Programs; LEP = Students with Limited English Proficiency; FRL = Students qualifying for Free/Reduced Lunch program; N/P = Not provided

The middle school has been classified as Needs Improvement because it did not demonstrate Adequate Yearly Progress (AYP) during the 2004-2005 school year. This classification is a result of failing to meet the *No Child Left Behind* (2001) criteria in the

Table 3

Classroom Demographics

Number of Students	Teacher 1	Teacher 2	Teacher 3	Teacher 4
Total	27	24	32	32
Boys	16	16	17	19
Girls	11	8	15	13
American/Indian Alaskan Native	0	0	1	0
Asian/Pacific Islander	0	0	1	0
Hispanic	27	18	26	27
Black/African American	0	3	2	4
White	0	3	2	1
IEP	1	0	0	5
LEP	27	5	0	6
BIP	3	2	0	2

Note. IEP = Students on Individualized Education Programs; LEP = Students with Limited English Proficiency; BIP = Behavior Intervention Plan

areas of English and Mathematics. This is the third consecutive year that the school has not met AYP.

The staff was comprised of 60 teachers and 5 administrators. Many teaching staff members were not designated as Highly Qualified by the State of Nevada including 68.0% of English teachers, 72.2% of Math teachers, 71.4% of Science teachers, and 33.3% of Social Studies teachers. The average class size for English and Math was 25 students, for Science 26 students, and for Social Studies 29 students. In the 2004-2005 school year, there were 182 suspensions or expulsions related to disciplinary incidents, representing approximately 13% of all students as compared to a district average 4.47% of all students.

In order to improve the school climate and provide a safe learning environment for both staff and students, in the fall of 2004 the school instituted School-wide Positive Behavior Support ([SWPBS], Sugai et al., 2005) and joined the Inclusive Schools Project. Through implementation of SWPBS, school personnel adopted consistent rules for all settings and provided instruction for all staff and all students on the behavioral expectations in all areas of the school. Additionally, they clarified their definitions of inappropriate school behavior and organized their discipline procedures into a cohesive plan that specifically designates how problem behavior will be handled and how appropriate behavior will be reinforced. The staff also received inservice workshops on inclusive educational practices throughout the 2005-06 school year. The Inclusive Schools Project is a staff development initiative designed to increase the number of students with diverse learning needs in the general education classroom. Two thirds of

the general education classes in the school included students with disabilities as required by the Inclusive Schools Project.

The school operated according to a rotating block schedule. There were six blocks of classes, five of which occurred each day. The schedule rotated each day so that all blocks occurred in continuous sequence. For example, on Monday the block schedule would be Block 1, Block 2, Block 3, Block 4, and Block 5. On Tuesday it would be Block 6, Block 1, Block 2, Block 3, and Block 4. Thus, five classes occurred four times per week and one class occurred five times per week. The class that occurred five times per week alternated accordingly. The rotating schedule affected when teachers could be observed.

Instrumentation

A Gateway Solo 1200 laptop computer and the *Behavioral Evaluation Strategy and Taxonomy*© (BEST) software were used to collect behavior data. BEST© is a software program that enables the user to conduct real-time data collection of multiple responses using a highly individualized category system (Sharpe & Koperwas, 1999). The *BEST System*© is comprised of two software programs that work together, *BEST© Collection* and *BEST© Analysis*. *BEST© Collection* is a fully programmable observational category system, capable of recording multiple responses in real time. The user creates a coding system, called a configuration file, where each event to be recorded is assigned a key on the computer's keyboard. These events can include dependent variables, environmental information, or any other relevant variable. Keys can be set to record single incidents or to toggle on and off for duration recording. A count down timer is programmed for the coding system. The count down timer provides the user a visual running time and ensures

that each session will last for the same duration by automatically terminating data recording when the timer runs out. See Appendix A for an illustrated description of how the software works.

BEST© Analysis is used to analyze the data collected. It can perform sequential and statistical analyses of the data. The software also constructed a time plot of the observation session with each target behavior marked sequentially along a timed axis. See Appendix B for a sample time plot. Data from BEST© was exported to Microsoft Excel®, which was used to produce the performance feedback graphs for participants. See Appendix C for sample performance feedback graphs. A Canon PIXMA iP90 portable color printer was used to print the performance feedback graphs. The teachers used a goal setting form modified with permission from Martin, Florence, Rao, and Fairbanks (2005) to identify performance goals for each of the five teaching behaviors. See Appendix D for a sample of the goal setting form and Appendix E for permission to use this form.

Response Categories

There were two categories of target behavior, with multiple responses in each category, used in this study. The first category was teacher behavior and the second category was student behavior.

Teacher Behavior

Five teacher behaviors were identified: (a) opportunities to respond, (b) academic praise, (c) academic corrective feedback, (d) behavioral praise, and (e) behavioral corrective feedback. An opportunity to respond was the occasion a teacher gives students

to perform an academic skill related to the current academic lesson. To be considered an opportunity to respond, the teacher must have solicited either verbal or nonverbal responses from an individual student or groups of students. The solicitation must be related to a learning opportunity. Examples of an opportunity to respond included verbal requests such as "Who can tell me the answer?", or cloze statements such as "Five plus six equals . . .?" or asking students to point to a place on a map. Non-examples included asking rhetorical questions such as "Who cares?", organizational queries such "Whose turn is it?", and nonacademic questions such as "Is it time for lunch?"

Academic praise was an affirmative verbal statement or nonverbal action by the teacher to a student who provided a correct academic response (e.g., answering a question verbally, writing an answer on the board, or finding information in a book). To be considered academic praise, the teacher's response must have occurred within 10 seconds of the student's behavior and have been intended to increase or maintain the student's behavior. Examples of academic praise included general verbal statements such as "Good job", "That's correct", and "Yes", specific praise statements such as "Six is the right answer" or "You answered that question and remembered to address all three parts" as well as nonverbal actions such as thumbs up, a smile and nod, or hand clapping. Non-examples of academic praise included failing to acknowledge the student's academic behavior, verbal statements such as "Not quite", and nonverbal actions such as head shaking or eye rolling.

Academic corrective feedback was a verbal statement or nonverbal action by the teacher in response to a student who provided an incorrect academic response. Teacher responses were recorded as academic feedback if the response occurred within 10

seconds of the student's error and either acknowledged that the student made an error, prompted another response, or provided the correct information. Examples of academic corrective feedback included verbal statements such as "Not quite", "Try again", "The correct answer is 12" and nonverbal actions such as head shaking or pointing to the correct answer. Non-examples included failing to acknowledge the student's academic behavior, unspecific statements such as "Okay", and nonverbal actions such as head nodding.

Behavioral praise was an affirmative verbal statement or nonverbal action by the teacher in response to a student's appropriate task or social behavior (e.g., sitting appropriately in chair, helping a peer find the right page). Behavioral praise was recorded if the teacher's response occurred within 10 seconds of the student's behavior, acknowledged the student's appropriate behavior, and was intended to increase or maintain that behavior. Examples of behavioral praise included statements such as "I appreciate the way you came in quietly", "Thank you for sharing your materials", and nonverbal actions such as a thumbs up or a pat on the back. Non-examples included statements such as "I'm waiting for you to be ready", "That's not acceptable", and nonverbal actions such as moving to stand beside a student who is behaving inappropriately.

Behavioral corrective feedback was a verbal statement or nonverbal action by the teacher in response to a student's inappropriate task or social behavior (e.g., calling out, hitting a peer). Behavioral feedback was recorded if the teacher's response occurred within 10 seconds of the student's behavior, acknowledged the student's inappropriate behavior, and was intended to decrease or correct that behavior. Examples of behavioral

feedback included statements such as "That's not appropriate", "I need your eyes on me", and nonverbal actions such as physically redirecting or restraining a student or using proximity to redirect a student. Non-examples included statements such as "I knew you could get it together", "That's much better", and planned ignoring.

Student Behavior

Three student behaviors were identified: (a) correct academic responses, (b) incorrect academic responses, and (c) disruptive behavior. Correct academic responses were the accurate verbal or nonverbal academic responses displayed immediately after the teacher presented an opportunity to respond. A correct academic response was recorded if the student provided the right answer, was answering in turn, and was directing his or her response to the teacher or towards the place indicated by the teacher. Examples of correct academic responses included statements such as "Five plus six equals eleven", pointing to the correct spot on a map, or writing a correct answer on the board. Non-examples included statements such as "The capital of the US is New York" or saying the answer aloud to a peer when the teacher calls on another student.

Incorrect academic responses were the inaccurate verbal and nonverbal academic responses displayed immediately after the teacher presented an opportunity to respond. An incorrect academic response was recorded if the student failed to provide an answer or provided the wrong answer. Examples of incorrect academic responses included statements such as "Five plus six equals nine", "I don't know" or non-responding. Non-examples included statements such as "You can't make me" or answering out of turn.

Disruptive behavior was behavior that did not have the approval of the teacher and interfered with the academic engagement of one or more students. Disruptive behavior

was recorded when a student was clearly engaged in tasks that did not have teacher approval, was talking without teacher approval, or was participating in the academic activity in an inappropriate manner. Examples of disruptive behavior included calling out answers, off-topic discussion with other students, moving around the room without permission, talking back to the teacher, and any off-task activity that causes the teacher to interrupt instruction. Non-examples included calling out answers during choral responding, or leaving the classroom appropriately and with permission.

Recording Procedures

Prior to the observation session, the laptop was set up by turning it on and opening the *BEST© Collection* program (see Appendix A for a description of the software and set up procedures). At the beginning of the session, the *Start* button activated the session timer. As events occurred, the appropriate key or keys were pressed on the keyboard to record their occurrence. Multiple keys could be activated simultaneously.

The program made a complete and integrated record of all of the events recorded during the session, including descriptive and sequentially time-stamped data. The data recorded included time of event and frequency. A behavior occurrence was recorded at the end of the event. For example, when a teacher asked a question an opportunity to respond was recorded at the end of the question. This method was selected to control for verbal behavior that is difficult to categorize at the beginning of the utterance and when it was not possible to determine the nature of the behavior until it is completed (e.g., if a student response was correct or incorrect).

The exception to this was the procedure for recording disruptive behavior. Disruptive behavior was recorded using duration timing. The keyboard key for disruptive behavior was programmed to act as a toggle switch. When a disruptive behavior began, the key was pressed once to begin duration recording. Once disruptive behavior had stopped, the key was pressed a second time to end duration recording. Duration was recorded for disruptive behavior because it was the only target behavior that occurred for varying lengths of time and could be sustained for long periods of time.

Student behaviors were recorded and analyzed collectively, with the classroom as the unit of analysis. Individual students were not identified. The *BEST*© software allowed for the recording of multiple responses simultaneously in real-time. Multiple examples of the same behavior that occurred at the same time were recorded as a single event. Different behavior was recorded as a unique event. For example, if a teacher presented an opportunity to respond and three students called out the correct answer and one student called out an incorrect answer, then one correct academic response was recorded and one incorrect academic response was recorded. This procedure was chosen because three separate correct academic responses would be recorded sequentially, thus exaggerating the amount of time that behavior occurred. However, if students called out correct answers one at a time, then each correct response would be recorded in sequence.

After 15 minutes, the *BEST*© program automatically ceased recording, signaling the end of the session. Once the data file was saved, analysis of the descriptive statistics were completed and the performance feedback graphs were printed for the teacher.

Design

A multiple probe design across four participants (Horner & Baer, 1978) was used in this study. There was one baseline condition and one intervention condition administered sequentially across each of the participants. Additionally, two maintenance sessions were conducted with Participant 3. During the baseline condition, participants were observed but did not receive any performance feedback and did not engage in goal-setting. During the intervention condition, participants continued to be observed while receiving daily feedback graphs and engaging in weekly goal-setting meetings. During maintenance, observations continued but no performance feedback was given and goal setting was not conducted.

Horner and Baer (1978) developed the multiple probe design, a combination of a multiple baseline design and probe techniques. Its distinguishing features are: (a) an initial baseline probe session of all participants, (b) an additional probe session for all participants when intervention is introduced to any baseline, and (c) a series of true baseline sessions for participants immediately prior to the introduction of the intervention. The length of the true baselines can vary but should be sufficient to establish stability. If each baseline shows changes in participant behavior upon the introduction of the intervention, then these changes can be attributed to that intervention. The design allows for comparisons between the behavior of participants receiving the intervention and the behavior of participants who have not yet been exposed.

The design is particularly suitable for establishing the functional relationship between an independent variable and a dependent variable in instances when extended baselines could prove reactive (Horner & Baer, 1978). Reactivity is behavior change that occurs as

a result of repeated assessment. The multiple probe design reduces the number of baseline sessions. This is of particular concern for Participants 3 and 4 who, in a traditional multiple baseline design, would be observed for 15 and 20 baseline sessions respectively before receiving intervention.

A second reason the multiple probe design was selected is that it does not require treatment withdrawal to demonstrate the effects of the intervention (Kazdin, 1982). Consequently, it can be used when behavior change may not be reversible. Intervention effects from performance feedback with goal setting may not be reversible once teachers are taught to attend to specific teaching behavior. Specifically, the presence of an observer in the classroom during both baseline and intervention conditions could serve as a prompt for the participants during a second baseline.

Description of Preparation and Baseline Procedures

Preparation

Preparation for the study included training observers and organizing participants. Two observers participated in the collection of interobserver agreement (IOA) data. One observer was a master's student in special education. The other was a doctoral student in special education. The observers were trained to a criterion standard using the *BEST*© software observation system, a computer laptop, and a video of a classroom lesson. During training, observers were first taught the response definitions for each student and teacher behavior. Each was given a printed copy of the response definitions and each definition was explained verbally. Observers were instructed to read the definitions again

prior to the software training. Before software training began, observers were asked if they understood the definitions and if they had any questions.

Next, the observers were taught how to use the *BEST©* software on the laptop, including how to open the program, operate the keyboard during observations, and how to save data files to the correct location. After a step-by-step demonstration of the process, each observer was given an opportunity to practice the steps with a model.

Last, observers practiced recording behavior data with the *BEST©* system while watching a video of a classroom lesson. The video of the lesson was 20 minutes long, divided into four 5 minute sections. Each section was watched and scored separately. Training sessions lasted an average of 30 min. The observer sat in front of the video with the laptop on his or her lap to mimic conditions during the study. While the video played, the observer watched and listened to the teacher on the recording and pressed the appropriate keys on the keyboard to record behavior events. When the video segment was over, the data were saved and a reliability analysis was conducted. The observer had an opportunity to ask questions regarding any behavior responses that had occurred. After the reliability analysis was complete, the observer watched and scored another segment. A maximum of four segments were scored per training session. The training criterion for IOA was 90% across all responses for two sessions. The first observer required four training sessions to achieve criterion. The second observer required three sessions.

One secondary observer was trained prior to the start of the study. The other secondary observer was trained prior to intervention for Teacher 3. Training for the last observer was delayed because her involvement in the study did not begin until the fifth

week and a 5-week interval between training and data collection was too long to ensure that the trained observation skills would be retained accurately.

Prior to baseline, the researcher met with each participant. During this meeting, a schedule for observations and intervention meetings was set up. The researcher explained how observations would be conducted, what to expect during observation, and provided the participant with a schedule of observation days. Information on the specific teacher and student behavior being observed was not shared. Teacher informed consent letters were signed at this time. The teacher was also given copies of the parent informed consent and student informed assent forms for distribution to the students in their classroom. See Appendix F for sample informed consent forms and approval for the study. Participants were told that after the baseline condition was completed they would begin weekly meetings and that they would be given more information on the intervention at that time.

Baseline

During baseline, observations were done from the back of the teacher's classroom with a clear view of the teacher, instructional materials, and students. For Teacher 2, observations were conducted from the front side of the classroom because there was no space at the back of the classroom. Data were recorded on a laptop computer with the *BEST© Collection* program. Each 15 minute observation session began by starting the program and activating the count down timer. After the session was over, data were analyzed immediately using the *BEST© Analysis*. A time plot was printed for the session and frequency of each target behavior was entered into the teacher's Excel™ spreadsheet. No feedback was given to the teacher nor goal setting conducted.

Intervention Procedures

The intervention phase consisted of daily observation sessions, daily performance feedback for the teacher, and weekly goal-setting sessions. The first intervention session occurred after the last baseline observation and prior to the first intervention observation session. During this session, the teacher received his or her baseline performance graphs and time plot, learned about each target behavior, and was given instruction on how to read the graphs. The teacher was encouraged to ask questions about the feedback in person during the meeting or by phone or via e-mail after the meeting. After reviewing the graphs, the goal setting form was introduced and the teacher was prompted through setting goals for the first week. Observation sessions continued according to baseline procedures. After each observation, the data were analyzed and graphed for the teacher.

Performance Feedback

During intervention teachers received performance feedback after each observation. Visual performance feedback was delivered to the teachers at the end of the observation class period. Visual feedback consisted of two behavior graphs and a time plot. See Appendix B for a sample time plot and Appendix C for sample graphs. Graphs were printed on 8½ x 11 inch paper. One graph displayed the number of opportunities to respond and the percentage of correct academic responses. The optimal level of 120 opportunities to respond per session was clearly marked with a solid green line. The teacher's weekly goal was marked in a dashed red line. Praise and corrective feedback events were graphed as a combination bar and line graph.

The second graph displayed the number of praise statements, corrective feedback statements, and disruptive student behaviors in a combination bar and line graph. The

stacked column format most cogently depicted the ratio between praise and feedback by showing the contribution of praise and feedback statements to the total number of praise plus feedback statements. The number of disruptive behaviors was marked with a line graph on top of the stacked bars.

A time plot was a graphic representation of sequential behavior data that illustrates all responses across the observation session. The purpose of the time plot was to provide teachers with a visual of sequential behavior patterns (e.g., to demonstrate how often incorrect academic responses were followed by academic feedback). Notes were added to the time plot to identify relationships between different behaviors (e.g., a box was drawn around a section of the time plot with high disruptive behavior and no OTRs). Another box was drawn around a section with low disruptive behavior and high OTRs to highlight the relationship between student engagement and disruptive behavior.

Goal Setting Meetings

Goal setting occurred once per week during a 15 minute interview. Goal setting meetings consisted of three parts. First, performance feedback from the week was reviewed for 4 to 8 minutes by looking at the graphs and time plots. The relationship between different behaviors was discussed to draw the teacher's attention to aspects of his or her performance that improved or needed to be improved. For example, as the frequency of OTR increased the teacher's attention was directed to the corresponding increase in student correct responses. Conversely, as the frequency of behavioral praise remained consistently below the teacher's goal, she or he was prompted to examine rates of praise and strategies for improving performance were discussed. For instance, if the teacher had low rates of academic praise during a particular lesson then instances when

academic praise could have been provided during that lesson were identified. The teacher was encouraged to ask questions and share his or her observations from the week.

Second, during all interviews except the initial one, the teacher's progress toward his or her goals was reviewed for 3 to 5 min, including circumstances that facilitated and hindered the teacher's progress. For example, the teacher was asked what factors influenced variations in their performance between sessions with high rates of target behavior and sessions with low rates. Each goal on the goal setting form was discussed in turn (See Appendix D). Again the teacher was encouraged to ask questions and share observations.

Finally, the teacher set new goals for the coming week in the last 2 to 4 minutes of the meeting. Goals for OTR, CAR, praise to feedback ratio, and use of corrective feedback were set using the following procedures. First, the average performance levels for the previous week were reviewed. The total number of behavior events for the week were added together and divided by the total number of sessions for the week. An illustration of this occurred during Teacher 3's second goal meeting. The mean frequency of OTR for that week had been 25 per session (75 total OTR divided by 3 sessions). Second, the teacher was encouraged to select a reasonable and achievable goal for increasing each behavior given their previous performance. In the current example, Teacher 3 decided to increase her mean OTR frequency by 5 OTR per session. Third, the teacher set a new goal for the following week. In Teacher 3's case, she set a goal of 30 OTR per session (her previous mean of 25 OTR plus her intended increase of 5 OTR). This process was repeated for each goal area. The amount of time allocated to each step varied as a

function of the number of questions teachers asked and the amount of discussion they engaged in.

At the end of the study, the teachers were asked to complete a social validation survey consisting of thirteen 6-point Likert scale items and four open-ended questions pertaining to the teacher's perception of the effectiveness, efficiency, and value of the study's goals and procedures. The teachers were also encouraged to share additional thoughts or concerns that were not covered by the survey. A copy of the social validation survey is included in Appendix F.

Maintenance Assessment Procedures

Maintenance data were collected only for Teacher 3. Because occasional teacher participant absences and the rotating block schedule necessitated different end dates for each participant, it was not feasible to collect maintenance data for the other participants before the end of the school year. Data were collected during two observation sessions conducted 8 and 10 days after the last intervention session. Again, the end of the school year prevented a longer latency between intervention and maintenance. Baseline observation procedures were followed during maintenance sessions. No goal setting was conducted during the maintenance phase. After the second maintenance observation was completed, Teacher 3 was given the performance graphs for those both sessions.

Interobserver Agreement

Interobserver agreement (IOA) data were collected for a total of 32.1% of all observation sessions. The availability of secondary observers restricted which sessions could be scored and thus sessions were not selected randomly. However, they were

distributed across all phases, across times of day, and between the two secondary observers.

Interobserver agreement was calculated for occurrences and non-occurrences of target behavior using the point-by-point agreement ratio where the number of agreements is divided by the number of agreements plus disagreements and multiplied by 100 (Kazdin, 1982). This method was selected because it is more conservative than a simple frequency percentage.

The *BEST*© program calculated agreement by aligning the two observers data files and comparing events within a specified range of acceptability. Aligning the data synchronized the start time of the two files. The *BEST*© software required that a range of time be set to determine an agreement. For this study the range of acceptability for agreement was set at 5 s. This meant that if the two observers recorded the same event within 5 seconds of one another it was counted as an agreement.

The interobserver agreement data across each condition are summarized in Table 4. The column labeled "Percentage of Total Sessions" displays the number and percentage of interobserver agreement sessions for each phase of the study. Interobserver agreement data were collected for 9 of 26 (34.6%) Baseline sessions; 16 of 53 (30.2%) Intervention sessions, and 1 of 2 (50%) Maintenance sessions. There were a total of 81 observation sessions in the study of which 26 (32.1%) were scored for interobserver agreement. The columns labeled "Teachers" display the interobserver agreement for Teachers 1 to 4, averaged across each condition. Mean interobserver agreement for Teacher 1 was 82.43% (range, 73.91 to 91.25%). Mean interobserver agreement for Teacher 2 was 86.18%

Table 4

Interobserver agreement: Experimenter vs. Second Observer as a Percentage of Point-By-Point Agreement on Dependent Variables

Condition	Percentage of Total Sessions	Teachers				Mean
		1	2	3	4	
Baseline	(9/26)[a] 34.6	82.38	77.78	80.54	89.23	81.36
Intervention	(16/53) 30.2	86.55		88.90	88.20	88.01
Maintenance	(1/2) 50.0	N/A		93.10	N/A	95.40
Grand Mean	(26/81) 32.1	82.43	86.18	87.11	88.89	85.35
Range		73.91 – 91.25	77.78 – 96.4	76.47 – 100	77.78 – 100	73.91 - 100

Note. [a]Numbers in parentheses show frequency counts of IOA sessions as a ratio of total sessions with the condition

(range, 77.78 to 96.4). Mean interobserver agreement for Teacher 3 was 87.11% (range, 76.47 to 100%). Mean interobserver agreement for Teacher 4 was 88.89% (range, 77.78 to 100%).

The far right column of Table 4 displays the average percentage of interobserver agreement across each condition of the study. Mean interobserver agreement was 81.36% for Baseline, 88.01% for intervention, and 95.40% for Maintenance. Mean interobserver agreement for all conditions was 85.53% (range, 73.91 to 100%).

Treatment Integrity

A treatment integrity checklist was completed for 100% of the intervention feedback and goal setting sessions (see Appendix G). After each intervention session the checklist was completed while graphs were printed and delivered to the teacher. The checklist was on a clipboard and kept beside the printer. During weekly goal setting sessions, the observers brought the checklist to the meetings where it served as a guide for the meeting. Reliability data for treatment integrity were collected for 32.1% of intervention feedback and 33.3% of goal setting sessions by having a second observer complete the checklist.

Table 5 displays a summary of the treatment integrity reliability data. Data are represented as a percentage of agreement between the primary and secondary observers across Teachers for all phases of the study. The columns labeled "Teachers" display the treatment integrity interobserver agreement for Teachers 1 to 4 across each condition. Mean interobserver agreement for all teachers was 100% for Intervention Feedback sessions and 100% for Intervention Goal Setting sessions.

Table 5

Treatment Integrity Interobserver Agreement: Experimenter vs. Second Observer as a Percentage of "Yes" and "No" Responses.

Condition	Percentage of Total Sessions	Teachers				Mean
		1	2	3	4	
Baseline	0	N/A	N/A	N/A	N/A	N/A
Intervention Feedback	(16/53)[a] 30.2	100	100	100	100	100
Intervention Goal Setting	(6/18) 33.3	100	100	100	100	100
Maintenance	0	N/A	N/A	N/A	N/A	N/A
Grand Mean	(24/71) 33.8	100	100	100	100	100

Note. [a]Numbers in parentheses show frequency counts of IOA sessions as a ratio of total sessions within the condition

The far right hand column of Table 5 displays the mean for percentage of agreement across each condition. The mean for Intervention Feedback was 100% and the mean for Intervention Goal Setting was 100%. The mean for treatment integrity interobserver agreement across all conditions and teachers was 100%.

Treatment of Data

Teacher Behavior

Data on teacher behavior were analyzed using visual inspection of behavior data graphs to answer Research Questions 1 through 3.

Question 1: Does training teachers to read performance feedback graphs and engage in goal-setting increase their rate per minute and frequency of opportunities to respond?

Analysis: The rate per minute of opportunities to respond was calculated by dividing the total number of opportunities to respond per session by 15, the total number of minutes per session. The rate per minute data was then graphed using a multiple probe design. Frequency of teacher behavior was calculated by counting the total number of OTR per session. Teacher behavior was analyzed by looking for changes in the slope, level, and magnitude (Tawney & Gast, 1984) in the data between baseline, intervention, and maintenance conditions.

Question 2: Does training teachers to read performance feedback graphs and engage in goal-setting increase their rate per minute and frequency of academic praise and corrective feedback?

Analysis: The rate per minute for academic praise was calculated by dividing the total number of praise statements by 15, the total number of minutes per session. The rate per

minute for academic corrective feedback was calculated by dividing the total number of corrective feedback statements by 15, the total number of minutes per session. The frequency data for both praise and corrective feedback was calculated by counting the total number of statements per session. The rate per minute and frequency data were then graphed separately using a multiple probe design. Teacher behavior was analyzed by looking for changes in the slope, level, and magnitude (Tawney & Gast, 1984) in the data between baseline, intervention, and maintenance conditions.

Question 3: Does training teachers to read performance feedback graphs and engage in goal-setting increase their rate per minute and frequency of behavioral praise and corrective feedback?

Analysis: The rate per minute for behavioral praise was calculated by dividing the total number of praise statements by 15, the total number of minutes per session. The rate per minute for behavioral corrective feedback was calculated by dividing the total number of corrective feedback statements by 15, the total number of minutes per session. The frequency data for both praise and corrective feedback was calculated by counting the total number of statements per session. The rate per minute and frequency data were then graphed separately using a multiple probe design. Teacher behavior was analyzed by looking for changes in the slope, level, and magnitude (Tawney & Gast, 1984) in the data between baseline, intervention, and maintenance conditions.

Research Question 4: Are teachers who receive performance feedback graphs and engage in goal-setting able to achieve and maintain a ratio of 4:1 praise to corrective feedback statements?

Analysis: A ratio of the number of praise behaviors to the number of corrective feedback behaviors was calculated for the baseline, intervention, and maintenance conditions. Ratios from each phase of the study were compared to assess changes over the duration of the study. Additionally, the actual ratios for each participant were compared to the recommended ratio of 4:1 to determine whether or not participants were able to achieve this ratio.

Student Behavior

Question 5: To what extent does increasing the teacher's rates of target behavior result in an increase of students' percentage and rate per minute of correct academic responses?

Analysis: The percentage of correct academic responses was calculated by dividing correct academic responses by correct plus incorrect academic responses and multiplying by 100. The percentage of correct academic responses was then graphed across phases. The rate of correct academic responses per minute was calculated by dividing the total number of correct academic responses by 15, the total number of minutes per session. The rate per minute of correct academic responses was then graphed using a multiple probe design. The student behavior graphs were analyzed using visual inspection by looking for changes in the slope, level, and magnitude in the data between baseline, intervention, and maintenance conditions (Tawney & Gast, 1984).

Question 6: To what extent does increasing the teacher's rates of target behavior result in a decrease of students' frequency and percentage of total session time of disruptive behavior?

Analysis: The frequency of disruptive behavior was calculated by counting the total number of disruptive behaviors per session. The percentage of total session time was calculated by dividing the total number of seconds that disruptive behavior occurred by 900, the total number of seconds per session. The frequency and percentage of total session time were then graphed using a multiple probe design. The student behavior graphs were analyzed using visual inspection by looking for changes in the slope, level, and magnitude in the data between baseline, intervention, and maintenance conditions (Tawney & Gast, 1984).

Social Validity

Question 7: To what extent are the teacher participants satisfied with the contextual fit of the goals, outcomes, and procedures of the intervention?

Analysis: The mean ratings by participants on the social validity survey questions 2, 3, 4, 5, 7, 8, and 9 were calculated. Means were evaluated to determine the degree to which participants agreed that study procedures were beneficial to them and their students.

Question 8: To what extent do teacher participants feel better prepared to meet the needs of students with challenging behavior in their classrooms?

Analysis: The mean ratings by participants on the social validity survey questions 1, 6, 10, 11, 12, and 13 were calculated. Means were evaluated to determine the degree to which participants agreed that study procedures were beneficial to them and their students. The content of participants' open-ended question answers was summarized and analyzed to determine the degree to which participants accurately identified the procedures and how effective they thought the procedures were.

CHAPTER 4

RESULTS

Presented in this chapter are the results of the study. The purpose of the study was to examine the effectiveness of performance feedback with goal setting on classroom teacher's effective teaching behavior and to subsequently examine the impact that changes in teacher behavior had on student behavior. Data were collected to answer the eight research questions related to teacher and student behavior. The results of the analyses of data are organized by research question. The chapter concludes with a summary related to all results obtained in the study.

Summary of Findings

Baseline

Baseline sessions were staggered for each teacher according to the multiple probe design (Horner & Baer, 1978). Teacher 1 received five baseline sessions. Teacher 2 received one probe and five baseline sessions. Teacher 3 received two probes and six baseline sessions. Teacher 4 received three probes and four baseline sessions. The baseline for Teacher 4 was shorter because the teacher was absent one day. The approaching end of the school year disallowed an extension of the baseline condition. The criteria for progressing to intervention were (a) a minimum of five data points had

been obtained and (b) data did not demonstrate a significant trend in the direction of improvement.

During baseline, all teachers exhibited the target behaviors, indicating that they had the behaviors in their repertoires. However, the target behaviors either occurred at very low levels (e.g., opportunities [OTR] for Teacher 1, behavioral praise [BP]for all teachers) or at highly variable levels (e.g., OTR for Teacher 4, behavioral corrective feedback [BCF] for Teacher 2). Consistent application of the target teaching behaviors was not observed in any of the teachers.

Intervention

The number of intervention observations and goal setting sessions varied for each teacher as a function of the multiple probe design (Horner & Baer, 1978) and the rotating block schedule which determined the number of times classes occurred each week. The total number of intervention observations was 19 for Teacher 1, 14 for Teacher 2, 12 for Teacher 3, and 8 for Teacher 4. The number of goal setting meetings also varied for each teacher. Meetings were held on average once per week, with two exceptions. Teacher 1 and Teacher 4 each received two meetings in one week (one on a Monday and one on a Friday) due to their inability to meet during their prep period the following week. Table 6 contains a summary of the frequency and duration data for the goal setting meetings.

Teacher 1 participated in seven meetings, Teacher 2 in five, and Teacher 3 in four, and Teacher 4 in three. The duration of each meeting was recorded and rounded to the nearest minute. The mean duration of goal setting meetings was 12.59 min (range, 8 – 15). Meetings were ended after 15 minutes. Teacher 1 preferred very short meetings, asked few questions, and tended to look at the graphs independently. Teacher 2 spent part

Table 6

Frequency and Duration of Goal Setting Meetings

Teacher	Frequency	Duration (Minutes)	
		Mean	Range
1	7	9.86	8 – 15
2	5	12.4	11 – 15
3	4	15.0	14 – 15
4	3	13.1	10 – 15
Total	18	12.59	8 – 15

of each meeting discussing a specific behavior he was trying to improve. Teachers 3 and 4 often used the maximum time allotment. Anecdotal data from goal setting meetings also indicated that they engaged in more dialogue about the data and target behaviors.

During intervention, there was an overall increase in teachers' use of the target behaviors from baseline means. Results for each behavior are reported below in relation to the research questions.

Research Questions and Related Findings

Question 1: Does training teachers to read performance feedback graphs and engage in goal-setting increase their frequency and rate per minute of opportunities for student responses?

Visual analysis of the level, trend, and magnitude of behavior change across baseline and intervention phases in Figure 1 suggests that performance feedback with goal setting

increased Teacher 1, 2, and 3's presentation of OTR. A gradual increase in frequency was evident during intervention for these participants. This change in behavior appeared in the frequency and rate per minute data. The treatment effect for Teacher 4 was not as clear, though intervention data demonstrated greater stability than baseline. Although teachers increased OTR, none came close to achieving the 120 OTR per session target established at the beginning of the study.

Figure 1 presents a graphical representation of the frequency of OTR for all teachers. Summary data on the frequency of OTR is provided in Table 7. Visual analysis of data for Teacher 1 demonstrated a stable baseline with low frequency and little variability. Her baseline mean was 6.2 OTR (range, 5 - 8). There was an increase in OTR when intervention was introduced, from 7 OTR in the last baseline session to 18 OTR in the first intervention session. Her intervention mean was 22.1 OTR (range, 2 - 46). The data demonstrated much more variability in the intervention condition, though overall there was a slight acceleration as evidenced by a higher mean over the last seven sessions (M = 25.9) than the first seven sessions (M = 17.3).

Visual analysis of data for Teacher 2 revealed more variability in baseline with a mean of 20.2 OTR (range, 3 - 32). There was a stable decelerating trend over the last three baseline sessions. As with Teacher 1, there was a substantial increase in OTR when intervention was introduced; Teacher 2 increased from 4 OTR in the last baseline session to 19 OTR in first intervention session. Teacher 2's intervention mean was 35.6 (range, 19 - 61). There was a gradual accelerating trend during intervention.

Figure 1: Frequency of Opportunities to Respond

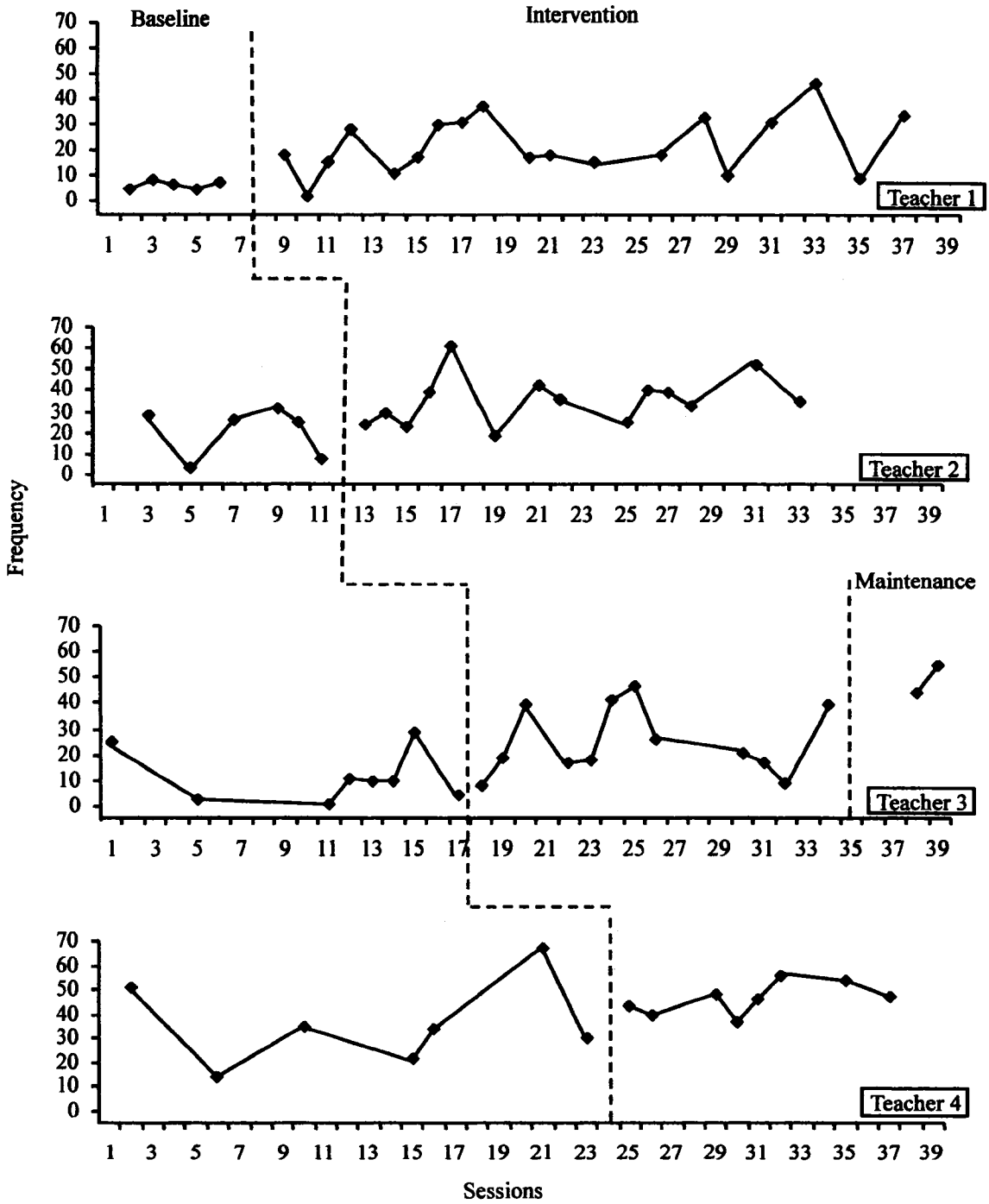


Table 7

Frequency of Opportunities to Respond

Teacher		Baseline	Intervention	Maintenance[a]
1	Mean	6.2	22.1	-
	Range	5 – 8	2 – 46	-
2	Mean	20.2	35.6	-
	Range	3 – 32	19 – 61	-
3	Mean	11.63	25.1	49.5
	Range	1 – 29	8 – 47	44 – 55
4	Mean	36	46.4	-
	Range	14 – 67	37 – 56	-
	Overall Mean	19.12	30.02	49.5
	Overall Range	1 – 67	2 – 61	44 – 55

Note. [a] Maintenance data were collected for Teacher 3 only.

Data for Teacher 3 showed a variable baseline with a mean of 11.63 OTR (range 1 – 29). No clear trends are evident in baseline data. The increase in level at the beginning of intervention was small, from 4 OTR in the last baseline session to 8 OTR in the first intervention session. Her intervention mean was 25.1 (range, 8 - 47). As with the previous teachers, there was a small acceleration in OTR frequency during intervention.

In maintenance, Teacher 3 had a significantly higher mean (49.5 OTR; range, 44 - 55) than in both previous conditions. There was an increase from the first maintenance session (44 OTR) to the second maintenance session (55 OTR), though the lack of a third

data point precludes establishing a trend in this phase. In the final goal setting meeting, Teacher 3 said that she was really seeing the benefits of using more OTR in all her classes. She further said that she planned to continue increasing OTR and that the higher level of student engagement was particularly beneficial to prepare students for their final exam.

The mean frequency of OTR for Teacher 4 was higher than the other participants in both conditions; though the means in baseline and intervention were similar. Teacher 4's baseline mean was 36 OTR (range, 14 - 67). There was a slight accelerating trend throughout baseline. Her intervention mean was 46.4 OTR (range, 37 - 56). Level increased from 30 OTR in the final baseline session to 43 OTR in the initial intervention session. The trend during intervention also accelerated, though no intervention session exceeded the baseline session high of 67 OTR. OTR frequency in intervention was more stable than during the highly variable baseline phase.

Evidence of a treatment effect was also apparent in teachers' rate per minute of OTR. Figure 2 shows a graphical representation of the rate per minute of opportunities to respond by all teachers. A summary of the data on the rate per minute of opportunities to respond is provided in Table 8.

Teacher 1's OTR rate per minute was .41 (range, .33 - .53) in baseline. Her rate was low and stable throughout baseline. There was an increase in level of .73 OTR per minute between the last baseline session (.47) and the first intervention session (1.20). Her mean OTR per minute in intervention was 1.47 (range, .13 - 3.07). Trends in Teacher 1's data varied across intervention. There were two accelerating trends in the first half of the

Figure 2: Rate Per Minute of Opportunities to Respond

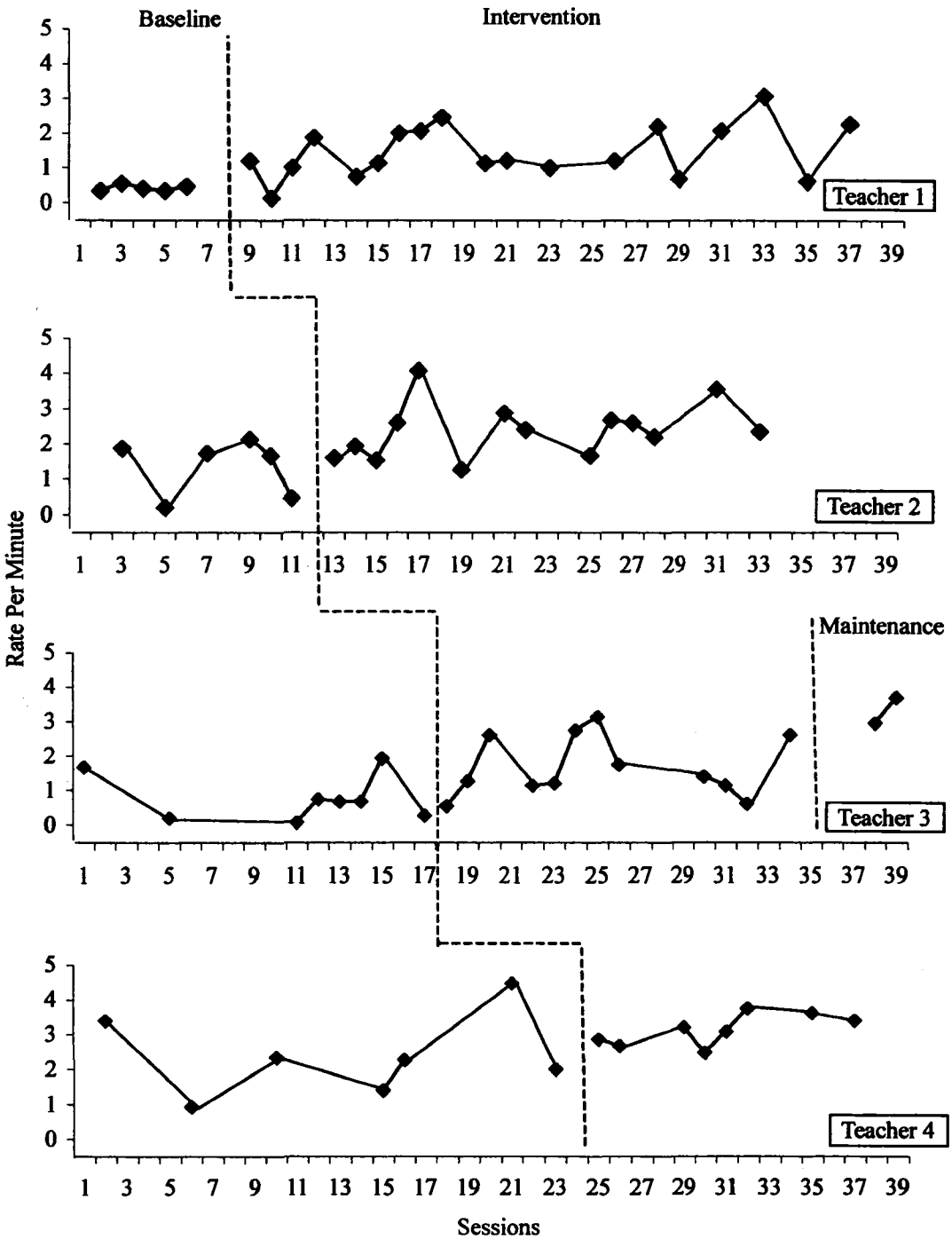


Table 8

Rate Per Minute of Opportunities to Respond

Teacher		Baseline	Intervention	Maintenance[a]
1	Mean	.41	1.47	-
	Range	.33 – .53	.13 – 3.07	-
2	Mean	1.34	2.38	-
	Range	.20 – 2.13	1.27- 3.53	-
3	Mean	.78	1.67	3.30
	Range	.20 – 1.93	.53 – 3.13	2.93 – 3.67
4	Mean	2.40	3.13	-
	Range	.93 – 4.47	2.47 – 3.60	-
	Overall Mean	1.27	2.01	3.30
	Overall Range	.20 – 4.47	.13 – 3.60	2.93 – 3.67

[a] Maintenance data were collected for Teacher 3 only.

phase, though a drop in level followed (Sessions 14 and 20, respectively). There were two sharp decreases in level towards the end of the study at Sessions 29 and 35. Prior to Session 35 the school administrator called the teacher into her office to reprimand her for classroom management issues. During Session 35, the teacher was noticeably quiet and withdrawn. There was a small and gradual increase in trend.

The mean OTR rate per minute for Teacher 2 in baseline was 1.34 (range, .20 - 2.13). His baseline was more variable than Teacher 1's, though there was a stable decelerating trend in the last three sessions. There was an increase in level of 1.13 OTR per minute

between the last session of baseline (.47) and the first intervention (1.60) session. Intervention mean rate of OTR was 2.38 (range, 1.27 – 3.53). Data were variable, with some overlap with baseline data. After the initial increase in level in intervention, there was a sharp acceleration trend. A dramatic drop in level followed this increase, a decrease of 19 OTR per minute from Session 17 to Session 19. Overall there was a gradual accelerating trend throughout intervention.

Teacher 3's baseline data revealed an accelerating trend towards the end of baseline, but with a decrease in rate of 1.20 OTR per minute in the final session. Mean OTR rate per minute for baseline was .78 (range, .20 - 1.93). Level change between baseline and intervention conditions was .26. There was an initial accelerating trend over the first three intervention sessions, followed by a drop in level. There was a decelerating trend during Sessions 30 through 32. Overall, OTR rates followed an accelerating trend through intervention with a mean rate per minute of 1.67 (range, .53 - 3.13).

Teacher 4's rates per minute of OTR were generally high in both conditions. Baseline data varied over a broad range with a mean rate per minute of 2.40 OTR (range, .93 - 4.47). There was a slight acceleration in the baseline trend. A level change of .87 OTR per minute occurred in the first intervention session. The mean rate per minute of OTR in intervention was 3.15 (range, 2.47 - 3.60). Intervention data were more stable than baseline line. There was a delayed accelerating trend in the middle of intervention followed by a slight deceleration.

Question 2: Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of academic praise and corrective feedback?

Visual analysis of the level, trend, and magnitude of behavior change across conditions in Figure 3 suggests that introduction of intervention resulted in an increase of teachers' use of academic praise (AP). There was a smaller increase in their use of academic corrective feedback (ACF). During baseline, praise and corrective feedback occurred at similar levels. Through the intervention condition there was a fractionation of the data, as praise increased over corrective feedback with all teachers.

Figure 3 presents a graphical representation of the frequency of AP and ACF. Teacher 1's use of AP and ACF was low and stable during baseline. Her mean frequency was 1.2 (range, 0 - 4) for AP and .6 (range, 0 - 1) for ACF. A summary of frequency data can be found in Table 9. With the introduction of performance feedback with goal setting there was a level increase in AP from the last baseline session (0) to the first intervention session (9). There was an increase in level of 2 ACF between the last baseline session to the first intervention session. Her mean frequency during intervention was 13 (range, 0 - 34) for AP and 3.7 (range, 0 - 11) for ACF.

For the majority of intervention sessions, AP occurred at a higher frequency than ACF. There was an accelerating trend for AP across the intervention condition. ACF increased in level over baseline with a fairly stable trend throughout intervention. Teacher 2 emitted low and stable rates of AP and ACF during baseline. His mean frequency of AP was 8.3 (range, 5 - 12) and ACF was 6.5 (range, 1 - 9). AP occurred at slightly higher frequencies than ACF though overall baseline data were stable. The introduction of intervention resulted in a level decrease of ACF, from 7 in the last

Figure 3: Frequency of Academic Praise (AP) and Academic Corrective Feedback (ACF)

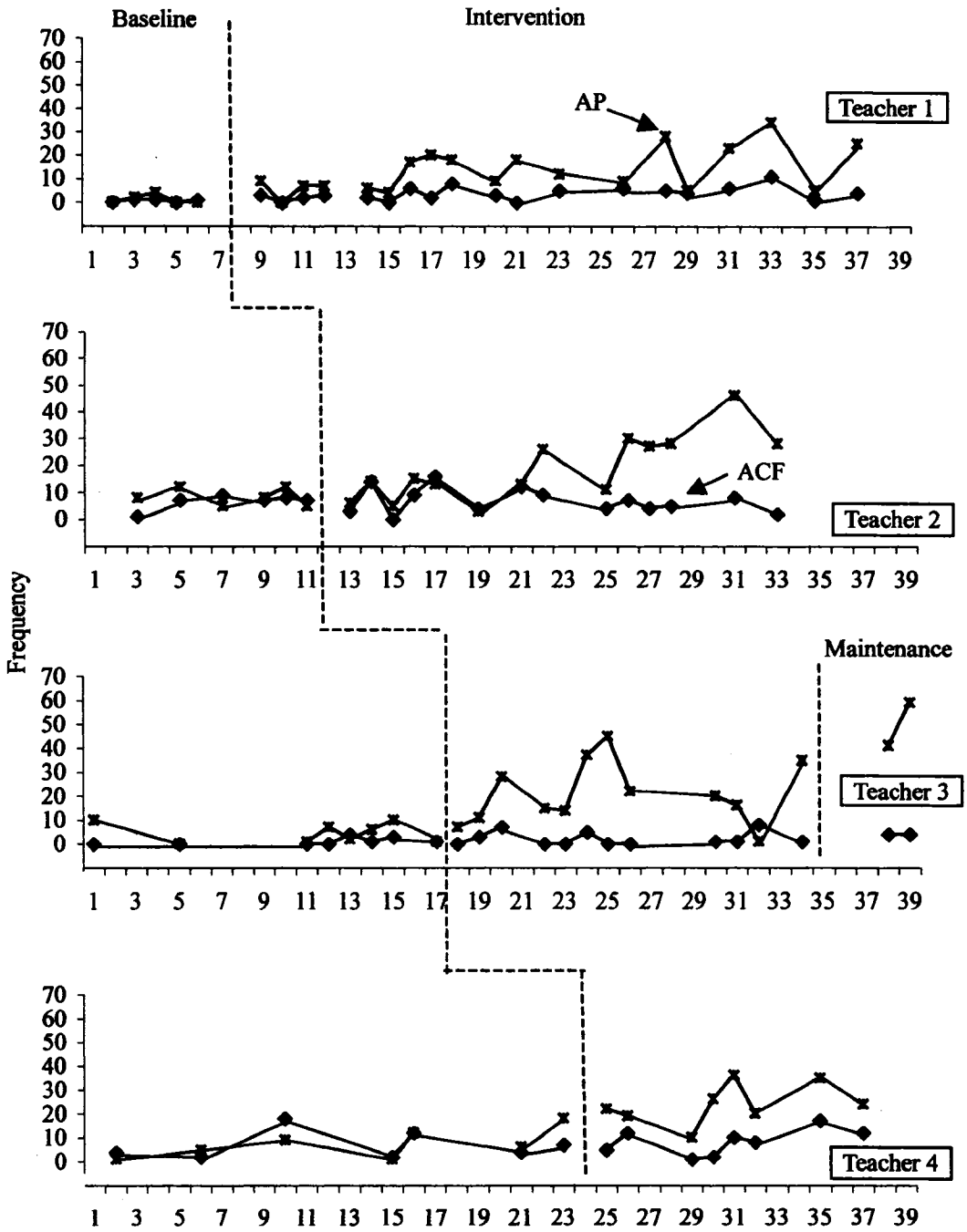


Table 9

Frequency of Academic Praise (AP) and Academic Corrective Feedback (ACF)

Teacher		Baseline		Intervention		Maintenance[a]	
		AP	ACF	AP	ACF	AP	ACF
1	Mean	1.2	.6	13.0	3.7	-	-
	Range	0 – 4	0 - 1	0 – 34	0 – 11	-	-
2	Mean	8.3	6.5	19.0	6.9	-	-
	Range	5 – 12	1 – 9	3 – 46	0 – 14	-	-
3	Mean	4.6	1.1	20.9	2.2	50	4
	Range	0 – 10	0 – 4	1 – 45	0 – 8	41 – 59	4
4	Mean	7.4	7	24	8.4	-	-
	Range	1 – 18	2 – 18	10 – 36	1 – 17	-	-
	Overall Mean	5.58	3.85	18.19	4.92	50	4
	Overall Range	0 – 18	0 – 18	0 – 46	0 – 17	41 – 59	4

Note. [a] Maintenance data were collected for Teacher 3 only.

baseline session to 3 in the first intervention session. Levels for AP were similar between the two sessions, with 5 in the last baseline session and 6 in the first intervention session.

Teacher 2 presented AP and ACF at similar frequencies during the first half of the intervention condition. Her mean for AP was 19.0 (range, 3 – 46) and for ACF was 6.9 (range, 0 – 14). During the second half, the data fractionated, with AP occurring at higher frequencies than ACF. AP displayed an accelerating trend over the course of intervention. ACF displayed a temporary acceleration early in the phase, though after Session 21 it appears there was a gradual decaying trend.

In Teacher 3's baseline, the mean frequency for AP was 4.6 (range, 0 - 10) and for ACF was 1.1 (range, 0 - 4). Baseline was stable without a distinct trend. Once intervention was introduced, there was immediate fractionation of AP and ACF data. The mean frequency for AP 20.9 (range, 1 - 45) and for ACF was 2.2 (range, 0 - 8). Despite an early increasing trend in ACF, it eventually followed a stable trend of near zero celeration. AP data were variable, though there was an accelerating trend across the condition.

High frequencies of AP continued during maintenance with a mean of 50 (range, 41 - 59). ACF increased from intervention to a mean of 4. The high frequency of AP appears to be a continuation of the accelerating trend of the intervention condition, however, without a third data point a trend a trend cannot be established for the maintenance phase.

Teacher 4's mean frequencies for AP and ACF in baseline were 7.4 (range, 1 - 18) and 7 (range, 2 - 18), respectively. AP and ACF occurred at similar frequencies during baseline with no clear trend in the data. During intervention, there was immediate and sustained fractionation of the data. The mean frequency for AP was 24 (range, 10 - 36).

The mean frequency for ACF was 8.4 (range, 1 - 17). Upon introduction of intervention, there was a small increase in AP and a small decrease in ACF. Teacher 4 displayed 18 AP in the final baseline session and 22 in the initial intervention session. Frequency for ACF was 7 and 5 respectively. Both AP and ACF followed accelerating trends during intervention.

Analysis of the rate per minute data for AP and ACF revealed similar results as the frequency data. A graphical representation of the rate per minute data for AP and ACF is shown in Figure 4. Table 10 contains a summary of the data on AP and ACF rate per minute. Teacher 1's baseline was stable with zero celeration. Her mean rate per minute was .08 (range, .00 - .53) for AP and .04 (range, .00 - .07) for ACF. The effects of treatment in intervention were delayed. There was a small level change of .60 for AP. No change in level was evident for ACF. Rates of AP eventually fractionated from rates of ACF. During intervention, Teacher 1's mean rate was .90 (range, .00 - 2.27) for AP and .25 (range, .00 - .73) for ACF. There was a clear accelerating trend for AP, though data were variable. Rates for ACF evidenced a small increase over baseline with less variability across intervention.

Teacher 2 displayed a stable baseline with no clear trends. Treatment effects in intervention were delayed but eventually resulted in fractionation of AP and ACF data. His AP rate per minute was .56 (range, .33 - .80) in baseline and 1.26 (range, .20 - 3.07) in intervention. No change in level was evident for AP or ACF between baseline and intervention. An accelerating trend was evident in the AP data. Teacher 2's ACF rate per minute was .43 (range, .07 - .60) in baseline and .46 (range, .00 - .93) in intervention.

Figure 4: Rate Per Minute of Academic Praise (AP) and Academic Corrective Feedback (ACF)

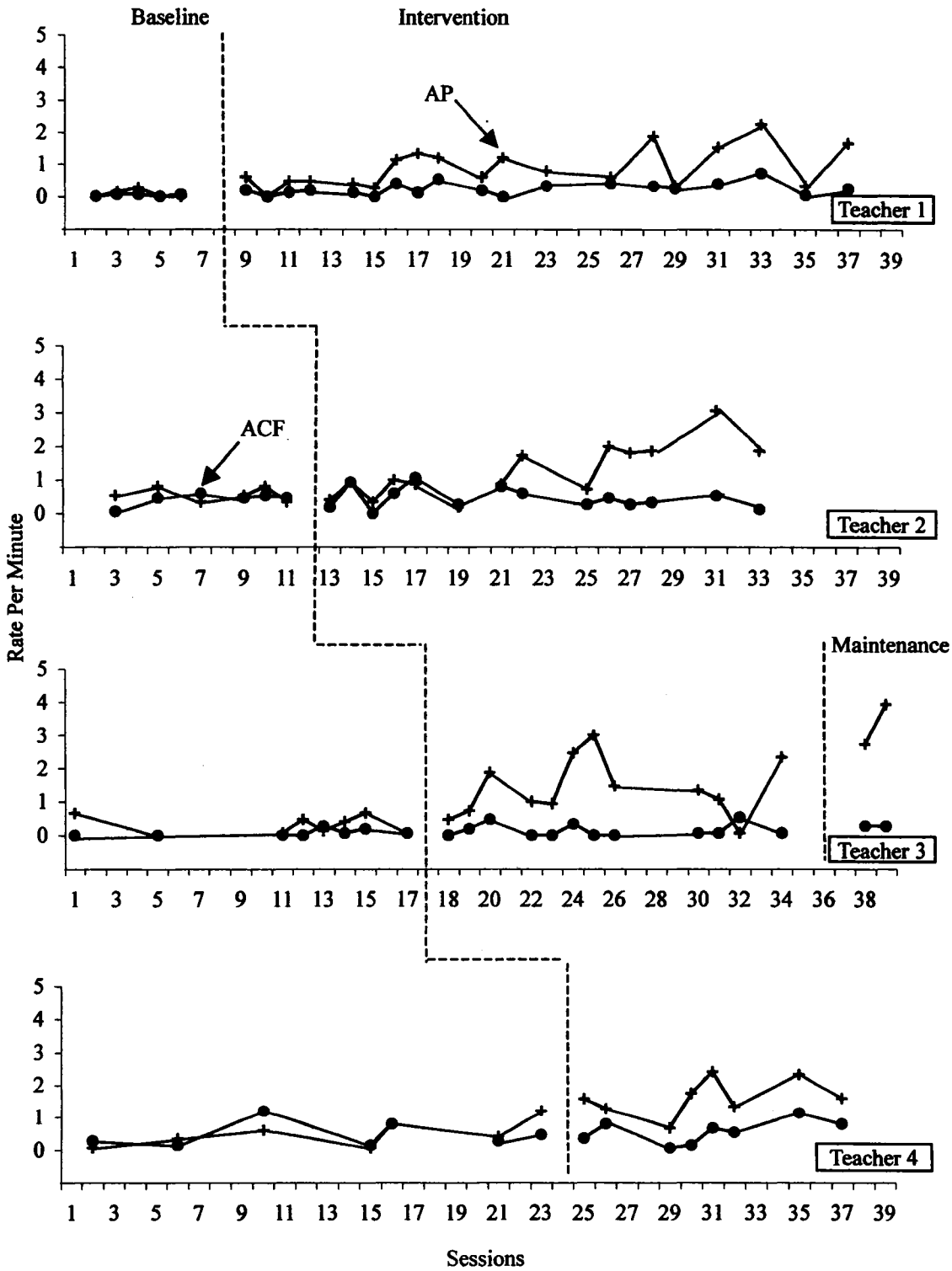


Table 10

Rate Per Minute of Academic Praise (AP) and Academic Corrective Feedback (ACF)

Teacher		Baseline		Intervention		[a]Maintenance	
		AP	ACF	AP	ACF	AP	ACF
1	Mean	.08	.04	.90	.25	-	-
	Range	.00 – .53	.00 – .07	.00 – 2.27	.00 – .73	-	-
2	Mean	.56	.43	1.26	.46	-	-
	Range	.33 – .80	.07 – .60	.20 – 3.07	.00 – .93	-	-
3	Mean	.31	.08	1.39	.14	3.33	.27
	Range	.00 – .67	.00 – .27	.07 – 3.00	.00 – .53	2.73 – 3.93	.27
4	Mean	.50	.47	1.60	.56	-	-
	Range	.07 – .80	.13 – 1.20	.67 – 2.33	.07 – 1.13	-	-
	Overall Mean	.37	.26	1.21	.33	3.33	.27
	Overall Range	.00 – .80	.00 – 1.20	.00 – 3.07	.00 – 1.13	2.73 – 3.93	.27

Note. [a] Maintenance data were collected for Teacher 3 only.

ACF data contained more variability at the beginning of intervention before declining to a stable trend with near zero celeration.

Baseline data for Teacher 3 reveal a stable trend for AP and ACF. Her mean rate per minute was .31 (range, .00 - .67) for AP and .08 (range, .00 - 1.20) for ACF. Effects of intervention on AP were immediate. There was an increase in AP when intervention was introduced, from .07 AP per minute in the final baseline session to .47 AP per minute in the initial intervention session. No change in level was apparent for ACF. AP and ACF data fractionated in the first intervention session and the rate per minute of AP remained higher than the rate for ACF across intervention. The mean rate for AP was 1.39 (range, .07 - 3.00), for ACF it was .14 (range, .00 - .53). AP data revealed an accelerating trend through intervention. ACF data revealed an early temporary acceleration but leveled out and maintained low rates throughout intervention.

Teacher 3 continued to display high rates of AP during maintenance. ACF occurred at rates higher than during intervention but substantially lower than AP. Her mean rate for AP was 3.33 (range, 2.73 - 3.93) and for ACF was .27 (range, .27). Without additional data points in this phase it is not possible to establish a trend. As suggested with OTR frequency, the higher rates of AP during maintenance are likely connected to Teacher 3's personal commitment to continue to improve her performance of the target behavior.

Teacher 4's baseline data were also stable and did not display a clear trend. Mean baseline rate was .50 (range, .07 - .80) for AP and .47 (range, .13 - 1.20) for ACF. In the last baseline session there was a noticeable difference between rates for AP and ACF. Level changes were not substantial between phases but fractionation of AP and ACF data was evident throughout intervention. Mean intervention rate was 1.60 (range, .67 - 2.33)

for AP and .56 (range, .07 - 1.13) for ACF. There was a temporary, sharp acceleration of AP in the middle of the intervention phase, though overall the trend was more gradual. ACF continued to be displayed at low rates, though there was a slight acceleration.

Question 3: Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of behavioral praise and corrective feedback?

Visual analysis of the level, trend, and magnitude of behavior change across conditions in Figure 5 did not reveal a functional relationship between performance feedback with goal setting and teachers' use of behavioral praise (BP) or behavioral corrective feedback (BCF). Three of the four teachers used BCF more frequently than BP in both conditions. In general, teachers did not substantially change their use of BP or BCF between baseline and intervention.

Teacher 1 engaged in BCF at higher frequencies than BP in baseline and intervention. See Table 11 for a summary of BP and BCF frequency data. Her mean frequency for BCF was 15 (range, 2 - 26) in baseline and 16 (range, 0 - 33) in intervention. BCF frequency data were variable across both conditions, though there was a decelerating trend towards the end of the intervention condition. Her mean frequency for BP was 1 (range, 0 - 4) in baseline and 3 (range, 0 - 13) in intervention. Although there was a change in level of 5 BP between phases and an initial increase in mean frequency, BP frequency remained low with a mode of 1 BP per session in intervention.

Teacher 2 also engaged in BCF at higher frequencies that BP during baseline and intervention. His mean frequency for BCF was 10 (range, 0 - 21) in baseline and 16 (range, 3 - 28) in intervention. There was a steady decelerating trend in BCF over the last three baseline sessions. Subsequently, there was a decrease in level from 10 BCF to 3

Figure 5: Frequency of Behavioral Praise (BP) and Behavioral Corrective Feedback (BCF)

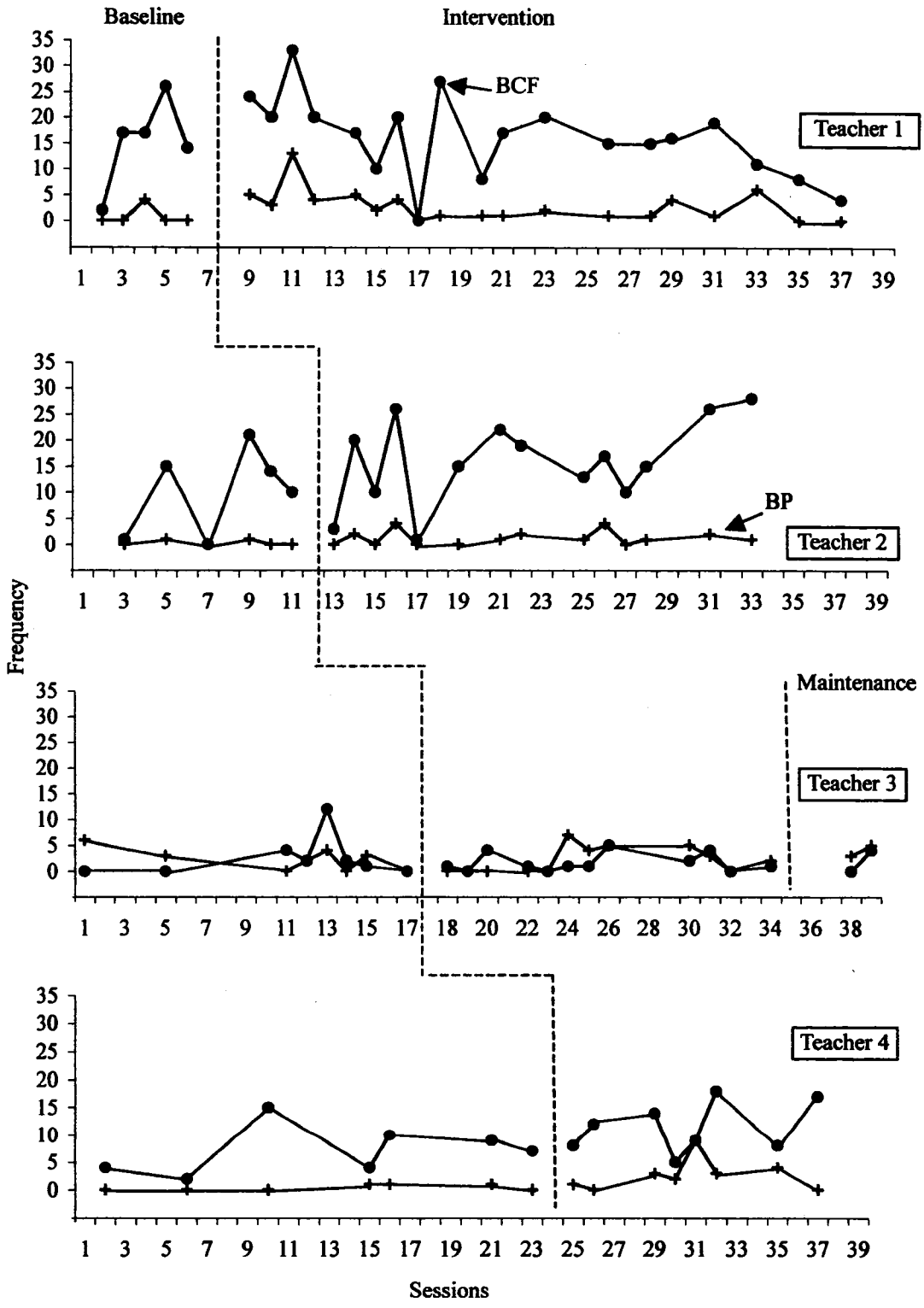


Table 11

Frequency of Behavioral Praise (BP) and Behavioral Corrective Feedback (BCF)

Teacher		Baseline		Intervention		Maintenance[a]	
		BP	BCF	BP	BCF	BP	BCF
1	Mean	1	15	3	16	-	-
	Range	0 – 4	2 – 26	0 – 13	0 – 33	-	-
2	Mean	0	10	1	16	-	-
	Range	0 – 1	0 – 21	0 – 4	3 – 28	-	-
3	Mean	2.25	2.63	2.17	1.67	4	2
	Range	0 – 6	0 – 12	0 – 7	0 – 5	3 – 5	0 – 4
4	Mean	0	7	3	11	-	-
	Range	0 – 1	2 – 15	0 – 9	5 – 18	-	-
	Overall Mean	1.04	8.04	2.26	12.08	4	2
	Overall Range	0 – 6	0 – 26	0 – 13	0 – 33	3 – 5	0 – 4

Note. [a] Maintenance data were collected for Teacher 3 only.

BCF between phases. BCF increased the following session and was highly variable through the initial intervention phases. Data also reveal an accelerating trend over the last four intervention sessions. Comparatively, BP data were stable and low. The mean frequency for BP was 0 (range 0 - 1) in baseline and 1 (range, 0 - 4) in intervention. There was no change in level between phases. With the exception of two outliers in Sessions 16 and 26 with 4 BP each, the trend was stable with near zero celeration.

Teacher 3's data displayed less differentiation in frequency of BP and BCF than the other participants. Her mean frequency for BP was 2.35 (range, 0 - 6) in baseline, 2.17 (range, 0 - 7) in intervention, and 4.0 (range, 3 - 5) in maintenance. Her mean frequency for BCF was 2.63 (range, 1 - 12) in baseline, 1.67 (range, 0 - 5) in intervention, and 2 (range, 0 - 4) in maintenance. BP data were stable in baseline and intervention. Maintenance mean frequency was higher but there was insufficient data to establish a trend. BCF data were stable during baseline with the exception of one outlier on Session 13. This spike in the data was likely related to a disruptive incident that occurred immediately prior to this class period in a neighboring classroom. BCF data were stable in intervention. Maintenance data ranged from 0 to 4. Again, a maintenance trend could not be established due to limited data points. Level changes between phases were not significant.

Teacher 4 had consistently higher frequency means for BCF than BP across study conditions. Her frequency mean for BP was 0 (range, 0 - 1) in baseline and 3 (range, 0 - 9) in intervention. Baseline data were stable with zero celeration and there was no change in level between phases. Intervention data revealed a slight accerleration in trend, though

there was a drop in frequency in the last session. Her frequency mean for BCF was 7 (range, 2 - 15) in baseline and 11 (range, 5 - 18) in intervention. BCF data were relatively stable in baseline. There was an accelerating trend during intervention, though there was also considerable overlap between conditions.

Visual analysis of the rate per minute data for BP and BCF revealed similar results to the frequency data. Rate per minute data are displayed in Figure 6. Table 12 displays summary data for mean rate per minute of BP and BCF. Evidence of a treatment effect from performance feedback with goal setting on participants rate per minute of BP and BCF was weak and temporary.

Teacher 1 displayed a low and stable rate per minute use of BP. Her mean rate per minute was .05 BP (range, .00 - .27) during baseline and .19 BP (range, .00 - .87) during intervention. Her mean rate per minute for BCF was 1.01 (range, .13 - 1.73) during baseline and 1.07 (range, .00 - 2.20) during intervention. At the first intervention session there was an increase in level of .33 for BP and .57 for BCF. BP rate was higher at the start of intervention but effects decreased over time. BCF rate also remained at the high end of the range at the beginning of intervention. BCF rates decreased over the course of intervention with a steady deceleration over the final sessions.

Results for Teacher 2 followed a similar pattern, with BCF mean rate greater than BP mean rate across both conditions. Mean rate for BP was .02 (range, .00 - .07) during baseline and .09 (range .00 - .27) during intervention. For BCF, his mean rate was .68 (range, .00 - 1.40) in baseline and 1.07 (range, .07 - 1.87) in intervention. BP baseline data was stable at near zero levels. BCF data was more variable, with a decelerating trendover the last three sessions of baseline. There was no level change for BP when

Figure 6: Rate Per Minute of Behavioral Praise (BP) and Behavioral Corrective Feedback (BCF)

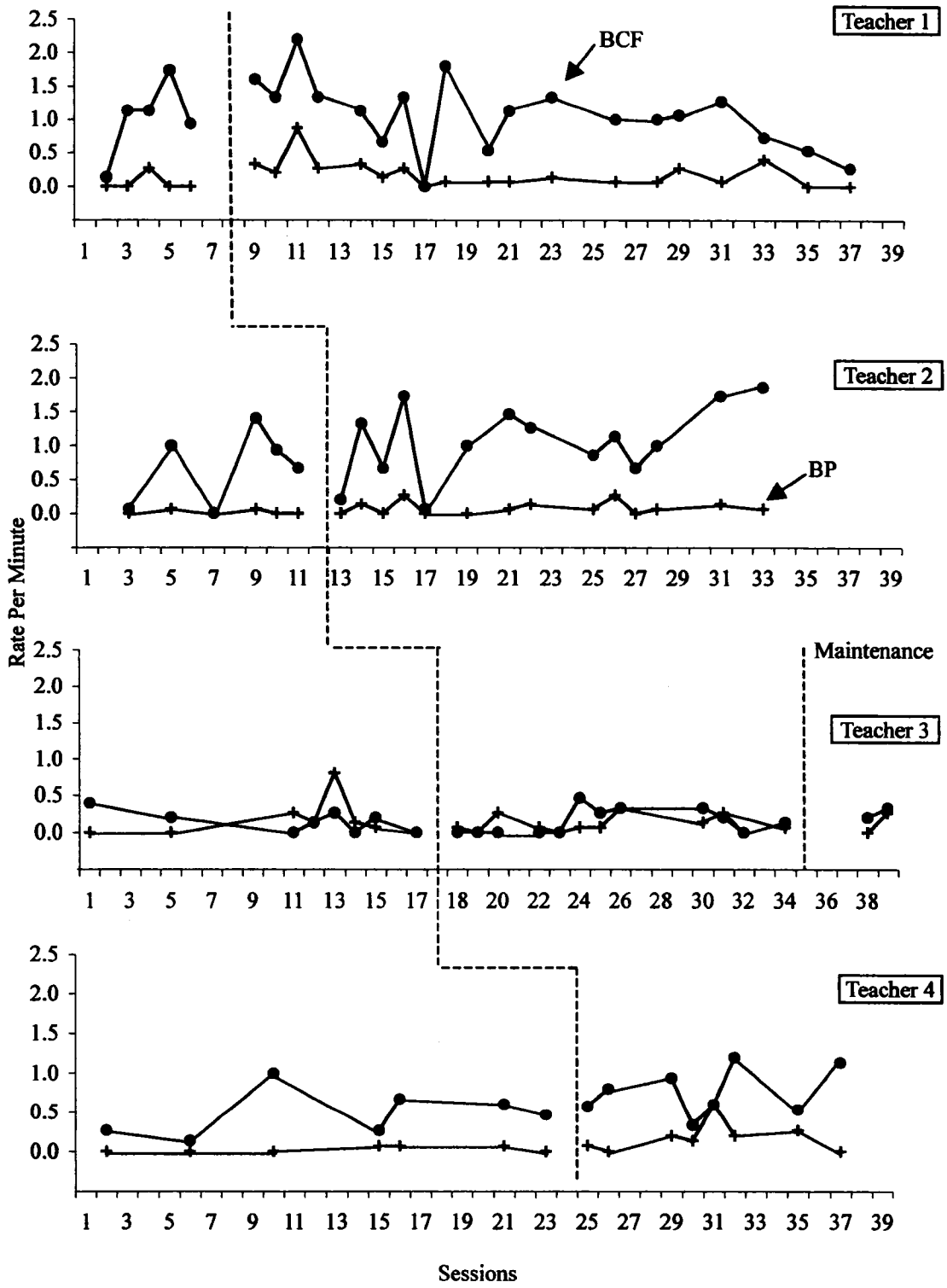


Table 12

Rate Per Minute of Behavioral Praise (BP) and Behavioral Corrective Feedback (BCF)

Teacher		Baseline		Intervention		Maintenance[a]	
		BP	BCF	BP	BCF	BP	BCF
1	Mean	.05	1.01	.19	1.07	-	-
	Range	.00 – .27	.13 – 1.73	.00 – .87	.00 – 2.20	-	-
2	Mean	.02	.68	.09	1.07	-	-
	Range	.00 – .07	.00 – 1.40	.00 – .27	.07 – 1.87	-	-
3	Mean	.15	.18	.14	.11	.27	.13
	Range	.00 – .40	.00 – .80	.00 – .47	.00 – .27	.20 – .33	.00 – .27
4	Mean	.03	.49	.18	.76	-	-
	Range	.00 – .07	.13 – 1.00	.00 – .60	.33 – 1.13	-	-
	Overall Mean	.07	.54	.15	.81	.27	.13
	Overall Range	.00 – .40	.00 – 1.40	.00 – .87	.00 – 1.87	.20 – .33	.00 – .27

Note. [a] Maintenance data were collected for Teacher 3 only.

intervention was introduced but there was a drop in level of .47 BCF per minute. BP data continued to occur at low rates and was stable across intervention. BCF variability persisted initially before becoming more stable. There was an accelerating trend in BCF data towards the end of intervention.

Unlike Teachers 1 and 2, Teacher 3 emitted more similar rates of BP and BCF across conditions. Her baseline rate per minute was .15 (range, .00 - .40) for BP and .18 (range, .00 - .80 for BCF). The spike in BCF data in baseline was attributed to a disruptive behavior incident that occurred prior to the session and involved several of her students. No treatment effects were evident during intervention. The mean rates during intervention were .14 (range, .00 - .47) for BP and .11 (range, .00 – .27). BP continued to occur at low rates. BCF increased slightly during intervention but rates remained very low. Similar results were found in during maintenance, with BP occurring at a rate of .27 (range, .20 - .33) and BCF at .13 (range, .00 - .27).

Results for Teacher 4 demonstrated similar data patterns as those found for Teachers 1 and 2. BCF occurred at a greater rate per minute in both conditions than BP. Teacher 4's mean rate for BP was .03 (range, .00 - .07) in baseline and .18 (range, .00 - .60) in intervention. BCF mean rate was .49 (range, .13 - 1.00) in baseline and .76 (range, .33) in intervention. BP data was low and stable in baseline, maintaining near zero levels of occurrence. There was no level change between baseline and intervention. A delayed effect was evident towards the middle of intervention though this deteriorated in the last session. There was also no evidence of a level change in BCF data. However, despite persistent variability in Teacher 4's data, there was a slight acceleration trend during intervention.

Question 4: Are teachers who receive performance feedback graphs and engage in goal setting able to achieve and maintain a ratio of 4:1 praise to corrective statements?

Analysis of data on the ratio of praise to corrective feedback revealed a difference between teacher's use of academic and behavioral statements. All teachers used academic praise more than behavioral praise. Only Teacher 3 was able to exceed the target 4:1 ratio for academic praise and academic corrective feedback across all conditions. Other teachers were able to achieve this ratio in occasional sessions but their condition means were below the target. Ratios for BP and BCF were much lower and only Teacher 3 delivered more BP than BCF. Table 13 provides a summary of data on the ratio of praise to corrective feedback.

In baseline, all teachers delivered AP more frequently than ACF. The mean ratio of AP to ACF was 2:1 (range, 0 - 4:1) for Teacher 1, 1.28:1 (range, .55 – 8:1) for Teacher 2, 4.1:1 (range, 0 – 10:1) for Teacher 3, and 1.06:1 (range, .25 - 2.57:1) for Teacher 4. During intervention, AP increased in relation to ACF. Mean ratios for teachers in intervention were 3.6:1 (range, 0 - 10:1), 2.73:1 (range, .75 - 14:1), 9.65:1 (range, .13 - 45:1), and 2.87:1 (range, .63 - 14:1), respectively. Teacher 3 met the target ratio of 4:1 for AP and ACF during baseline and more than doubled her ratio in intervention. Teacher 1 almost achieved the target ratio for AP to ACF in intervention. During maintenance, Teacher 3's mean ratio increased to 12.5:1 (range, 10.25 - 14.75:1) more than three times her baseline.

Results for BCF did not show the same degree of improvement. BCF occurred more frequently than BP in baseline and intervention for Teachers 1, 2, and 4. Baseline mean ratios were .05:1, .03:1, and .06:1 respectively. These ratios improved slightly

Table 13

Ratio of Academic and Behavioral Praise to Academic and Behavioral Corrective Feedback Across Participants and Conditions

Teacher		Baseline		Intervention		Maintenance[a]	
		Academic	Behavior	Academic	Behavior	Academic	Behavior
1		2:1	.05:1	3.6:1	.18:1	-	-
	Range	0 – 4:1	0 - .24:1	0 – 10:1	0 - .39:1	-	-
2		1.28:1	.03:1	2.73:1	.08:1	-	-
	Range	.55 – 8:1	0 - .07:1	.75 – 14:1	0 – .24:1	-	-
3		4.1:1	.86:1	9.65:1	1.3:1	12.5:1	2:1
	Range	0 – 10:1	0 – 6:1	.13 – 45:1	0 – 7:1	41 – 59:1	1.25 – 3:1
4		1.06:1	.06:1	2.87:1	.24:1	-	-
	Range	.25 – 2.57:1	0 – .25:1	.63 – 14:1	0 - .13:1	-	-
	Overall Ratio	1.45:1	.13:1	3.97:1	.19:1	12.5:1	2:1
	Overall Range	0:0 – 3.33:1	0:0 – 6:0	0:1 -14.0:1	0:1 - 7:1	10.25:1 – 14.75:1	1.25:1 – 3:0

Note. [a] Maintenance data were collected for Teacher 3 only.

during intervention. Teacher 1's mean ratio of BP to BCF was .18:1 (range, 0 - .39:1), Teacher 2's was .08:1 (range, 0 - .24:1), and Teacher 4's was .24:1 (range, 0 - .13:1). Only Teacher 3 delivered BP more frequently than BCF in any session. In baseline, Teacher 3's mean ratio was .86:1 (range, 0 - 6:1). After intervention her mean ratio improved to 1.3:1 (range, 0 - 7:1) and during maintenance it improved again to 2:1 (range, 1.25 - 3:1). During maintenance, Teacher 3's ratios continued to improve. Her mean ratio of AP to ACF was 12.5:1 (range, 41 – 59:1). For BP to BCF her mean ratio was 2:1 (range, 1.25 – 3:1).

Question 5: To what extent does increasing the teacher's rates of target behavior result in an increase of students' percentage of correct academic responses?

Visual analysis of the trend, level, and magnitude of the data in Figure 7 on the percentage of correct academic responses revealed little change from baseline to intervention. Mean percentages were high and fairly stable across teachers. See Table 14 for a summary of mean percentage data for all participants. Baseline means were 96.67% (range, 83.3 – 100%) for Teacher 1, 80.99% (range, 64.9 – 100%) for Teacher 2, 92.84% (range, 84.1 – 100%) for Teacher 3, and 86.23% (range, 70.73 - 94.03%) for Teacher 4. Teacher 1, 3, and 4 had stable and fairly level baseline trends. Data for Teacher 1 and 3 included two outlier sessions with noticeably lower percentage of correct responses in Session 4 and Session 13 respectively. In both sessions, teachers were introducing new vocabulary to students. The reading of unfamiliar words accounted for the lower percentage of correct responses as students practiced unfamiliar words. Teacher 2's data were variable and revealed a slight deceleration over baseline.

Figure 7: Percentage of Correct Academic Responses

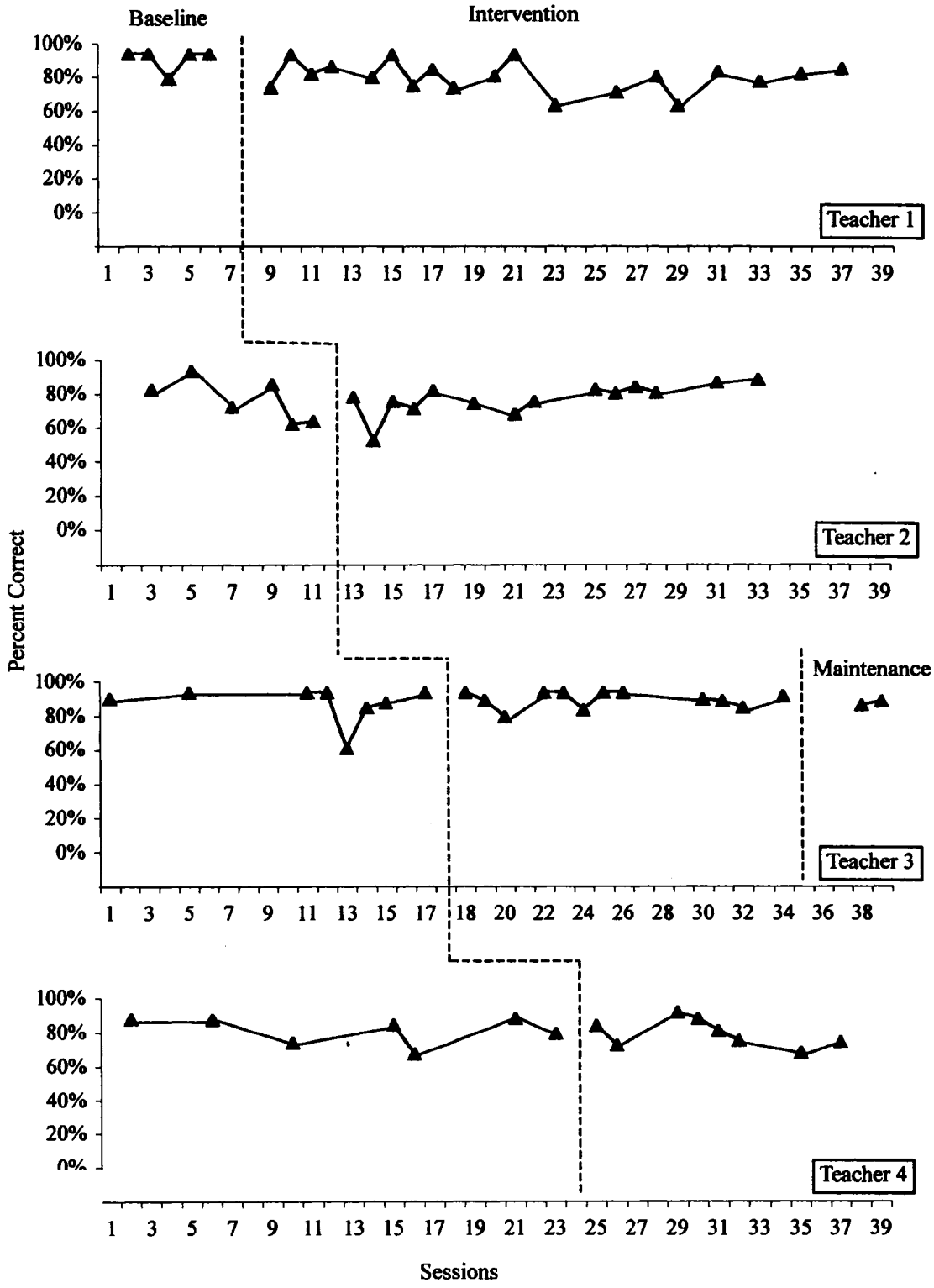


Table 14

Percentage of Correct Academic Responses

Teacher		Baseline	Intervention	Maintenance[a]
1	Mean	96.67	84.59	-
	Range	83.3 - 100	77.8 – 100	-
2	Mean	80.99	88.93	-
	Range	64.9 – 100	54.5 – 94.1	-
3	Mean	92.84	95.0	92.72
	Range	84.1 – 100	63.6 – 100	91.49 – 93.94
4	Mean	86.23	84.04	-
	Range	70.73 – 94.03	71.7 – 93.5	-
	Overall Mean	83.99	81.58	92.72
	Overall Range	64.9 – 100	54.5 -100	91.49 – 93.94

Note. [a] Maintenance data were collected for Teacher 3 only.

With the introduction of performance feedback with goal setting, there was a decrease in level for Teacher 1 (19.0%) and an increase in level for Teacher 2 (14.5%). No level changes were observed with Teacher 3 or 4. Intervention means were 84.59% (range, 77.8 – 100%) for Teacher 1, 88.93% (range, 54.5 - 94.1%) for Teacher 2, 95.0% (range, 63.6 – 100%) for Teacher 3, and 84.04% (range, 71.7 - 93.5%) for Teacher 4. Teacher 1's data decreased in the middle of intervention with evidence of acceleration over the last sessions. Teacher 2's data also displayed an accelerating trend through intervention. Teacher 4's intervention data included a decelerating trend for most of intervention.

Teacher 3's data were stable, with no evident celeration through intervention. Maintenance data revealed similar percentages. The high and stable trend likely indicates a ceiling effect for percentages correct academic responses. There was little room for improvement in the percentage of correct responses for Teacher 3's students.

In contrast to the data for percentage correct, visual analysis of the trend, level, and magnitude of rate per minute of correct academic responses suggest that intervention increased the rate of student responding for Teachers 1, 2, and 3. Figure 8 presents a graphical representation of the rate per minute of correct academic responses. Rate per minute of correct academics responses is summarized in Table 15. Baseline mean rate per minute was .33 (range, .27 - .40) for Teacher 1, 1.20 (range, .20 - 2.00) for Teacher 2, .68 (range, .07 - 1.80) for Teacher 3, and 2.22 (range, .93 - 4.20) for Teacher 4.

Teacher 1 had near zero levels of student responses in baseline. There was a .60 level increase with the introduction of intervention. Her intervention mean rate per minute was 1.18 (range, .08 - 2.33). Although her intervention data were variable, there was an accelerating trend. Teacher 2 baseline rate was more variable with a decelerating trend over the last three sessions. His intervention mean was 1.96 (range, .73 - 3.53) with an increase in level of .99 correct responses per minute between phases. Intervention data revealed a temporarily sharp acceleration at the beginning of intervention. A sharp drop in level followed in Session 19. Correct response rate increased more gradually over the rest of intervention.

Teacher 3's baseline data were variable with a mean of .68 (range, .07 – 1.80). There was a level increase of .40 correct responses per minute between baseline and intervention. Her intervention mean was 1.65 (range, .40 - 3.13) and showed two initial

Figure 8: Rate Per Minute of Correct Academic Responses

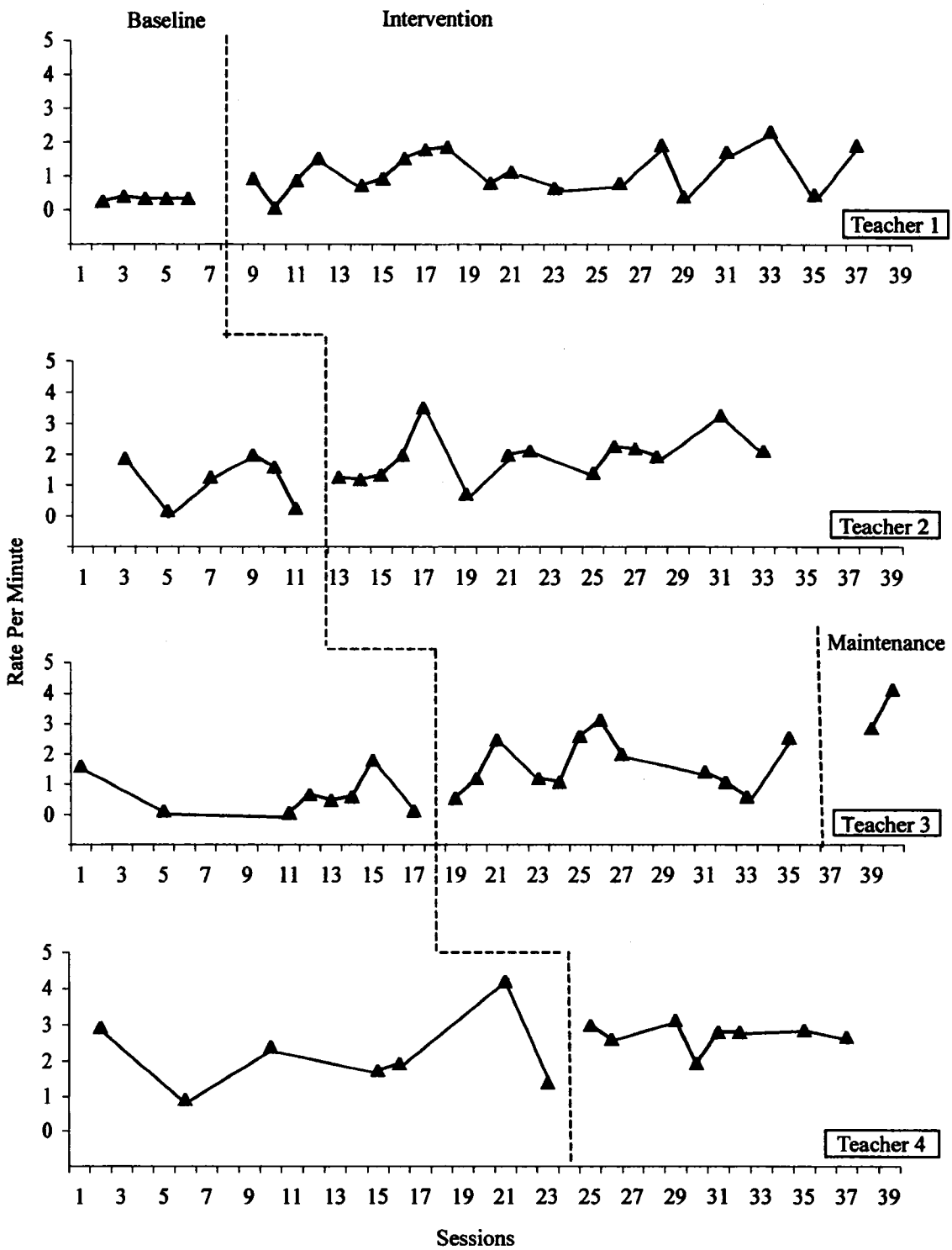


Table 15

Rate Per Minute of Correct Academic Responses

Teacher		Baseline	Intervention	Maintenance[a]
1	Mean	.33	1.18	-
	Range	.27 – .40	.07 – 2.33	-
2	Mean	1.20	1.96	-
	Range	.20 – 2.00	.73 – 3.53	-
3	Mean	.68	1.65	3.50
	Range	.07 – 1.80	.40 – 3.13	2.87 – 4.13
4	Mean	2.22	2.70	-
	Range	.93 – 4.20	1.93 – 3.13	-
	Overall Mean	1.15	1.72	3.50
	Overall Range	.07 – 4.20	.07 – 3.53	2.87 – 4.13

[a] Maintenance data were collected for Teacher 3 only.

sharp accelerations separated by a drop in level. A deceleration towards the end of intervention was followed by an increase during the last session. Maintenance data were higher than intervention with a mean rate of 3.50 (range, 2.87 - 4.13). Although there was an increase over the two sessions, without a third a trend could not be established.

Teacher 4's rate per minute was highly variable during baseline without a clear trend. Baseline mean was 2.22 (range, .93 – 4.20). During intervention her mean increased to 2.70 (mean, 1.93 – 3.13). Intervention data were stable with zero celeration and with reduced variability over baseline conditions.

Figure 9 presents a graphical representation of the frequency of OTR and correct academic responses. The graphs for each teacher demonstrate that the frequency of student's correct academic responses closely tracked that of teacher OTR. Low frequency of OTR (e.g., Teacher 1's baseline), resulted in low frequencies of correct academic responses. High frequency OTR evidenced in the intervention condition (e.g., Session 17 for Teacher 2) resulted in high frequency CAR. The consistent pattern of OTR and CAR across teachers is evidence of a functional relationship between these two behaviors. By presenting more OTR, teachers increased the number of correct academic responses of their students.

Question 6: To what extent does increasing the teacher's rates of target behavior result in a decrease of students' rates of disruptive behavior?

Visual analysis of the trend, level, and magnitude of the frequency of disruptive behavior showed inconsistent effects of intervention across participants. Figure 10 presents a graphical representation of the frequency of disruptive behavior. Table 16 contains a summary of the frequency data for disruptive behavior. Teacher 1 and 2 had high rates of disruptive behavior for much of baseline, though there was variability in their data. Mean frequencies during baseline were 15 (range, 8 - 26) for Teacher 1 and 16 (range, 8 - 26) for Teacher 2. Both had an intervention mean of 12 disruptive behaviors per session (range, 0 - 31 for Teacher 1; range, 2 - 20 for Teacher 2). There was a decelerating trend in intervention for both Teacher 1 and Teacher 2.

Teacher 3 had low and stable trends in baseline, intervention, and maintenance. Her means for frequency of disruptive behavior were 1.25 (range, 0 - 8) in baseline, 1.08 (range, 0 - 5) in intervention, and 2.50 (range, 2 - 3) in maintenance. No level changes

Figure 9: Frequency of Opportunities to Respond and Correct Academic Responses

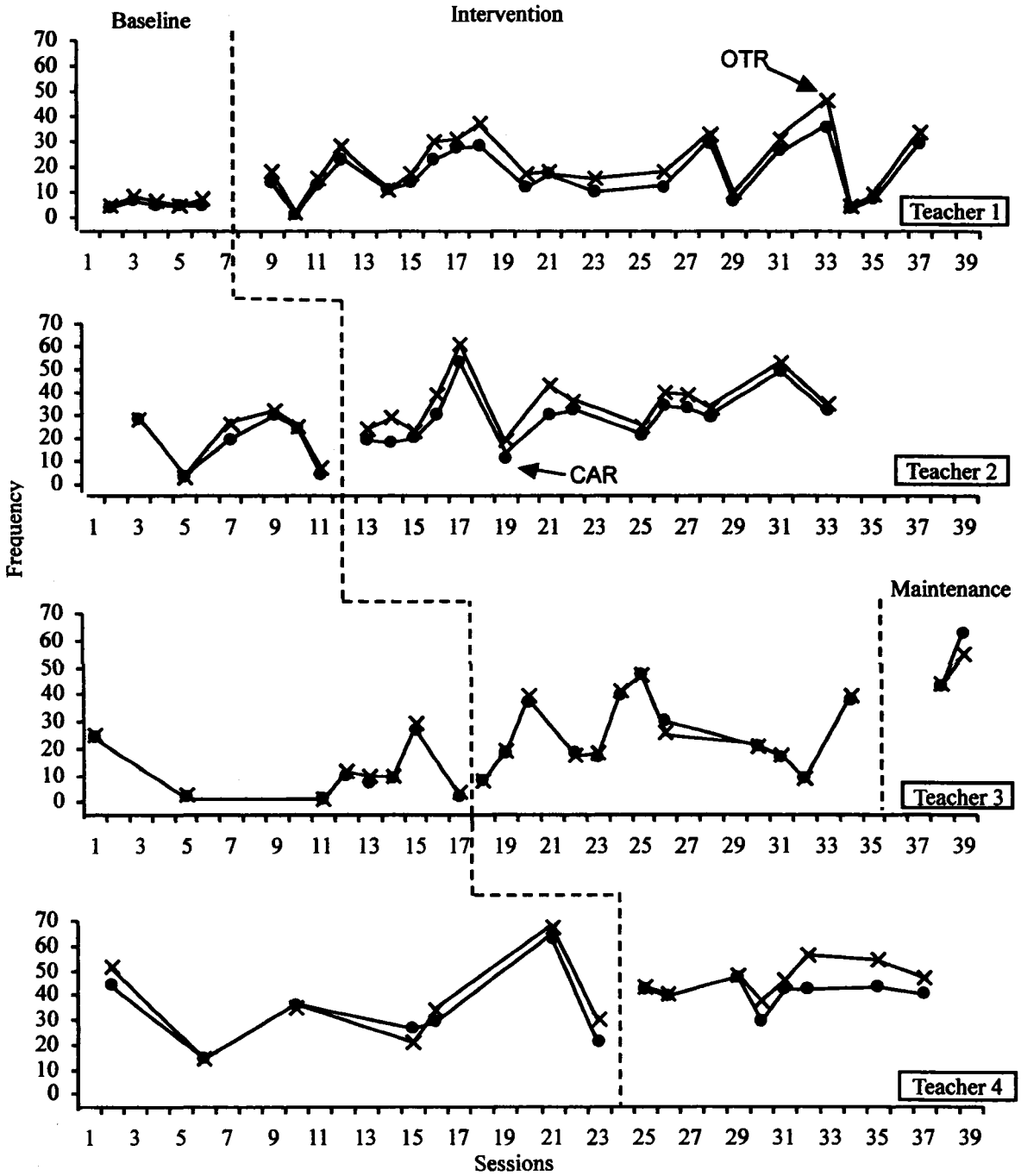


Figure 10: Frequency of Disruptive Behavior

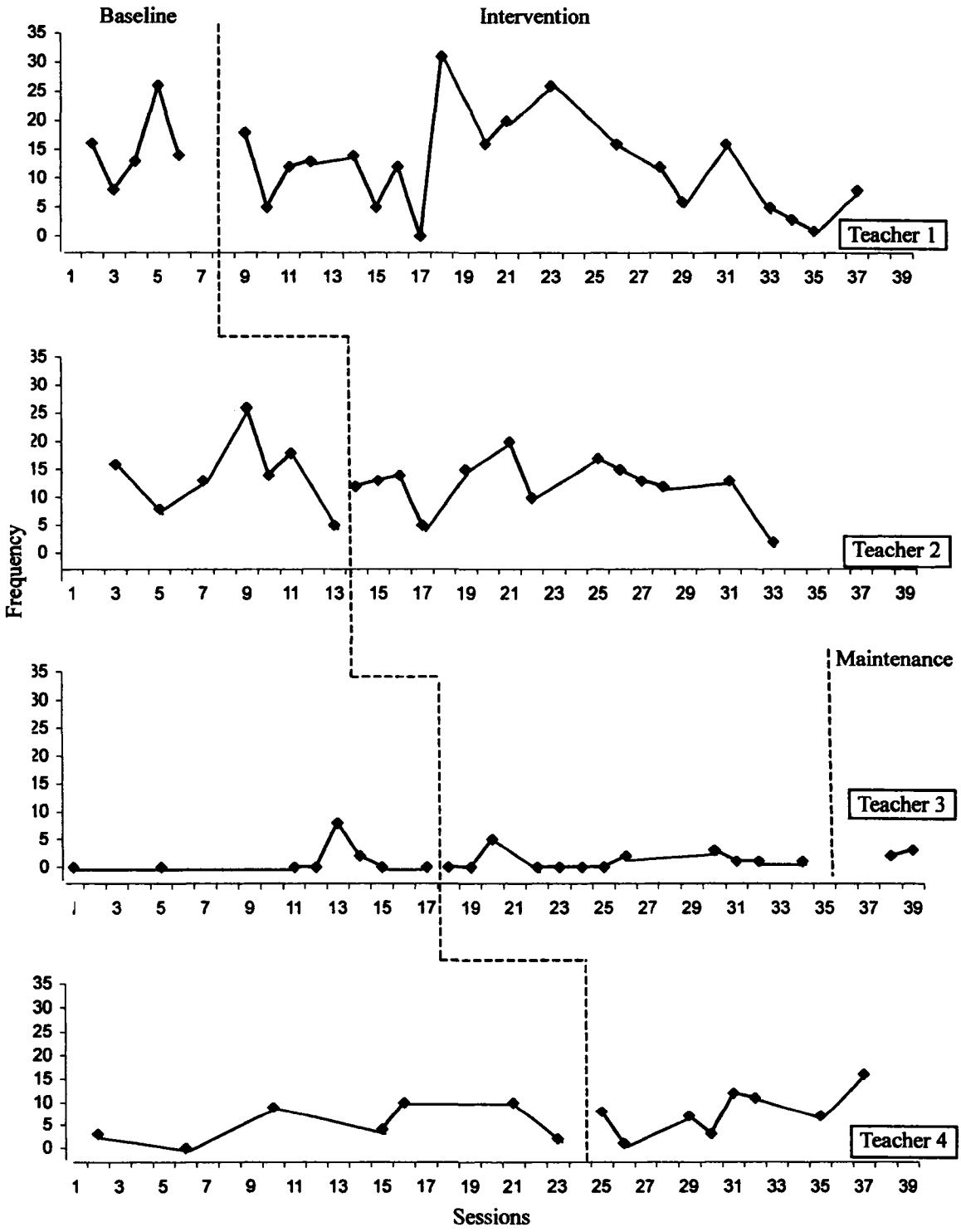


Table 16

Frequency of Disruptive Behavior

Teacher		Baseline	Intervention	Maintenance[a]
1	Mean	15	12	-
	Range	8 – 26	0 – 31	-
2	Mean	16	12	-
	Range	8 – 26	2 – 20	-
3	Mean	1.25	1.08	2.50
	Range	0 – 8	0 – 5	2 - 3
4	Mean	5.4	8.1	-
	Range	0 – 10	1 – 16	-
	Overall Mean	8.46	9.06	2.50
	Overall Range	0 – 26	0 – 31	2 - 3

Note. [a] Maintenance data were collected for Teacher 3 only.

were evident between the phases. Given the near zero frequency of disruptive behavior there was little room for improvement across phases. Teacher 4 had a stable frequency of disruptive behavior during baseline with a mean of 5.4 (range, 0 - 10). There was an increase in level of 6 disruptive behaviors between baseline and intervention. Her mean frequency in intervention was 8.1 (range, 1 - 16). Data were variable over intervention with a small acceleration towards the end of intervention.

The overall low frequency of disruptive behavior towards the end of intervention was contrasted with the percentage of total time that disruptive behavior occurred. A

graphical representation of the percent of total session time of disruptive behavior is presented in Figure 11. Table 17 displays a summary of the percentage of total session time of disruptive behavior data. Visual analysis of the level, trend, and magnitude of these data revealed an accelerating trend for Teachers 1 and 2. Baseline mean percentage of total session time of disruptive behavior was 25 (range, 6 - 79) for Teacher 1 and 21 (range, 0 - 100) for Teacher 2. At the introduction of intervention there was no level change evident for Teacher 1 but Teacher 2 had a level decrease of 39%. Data for Teacher 1 and 2 followed an accelerating trend through baseline, though Teacher 1's data were more variable in the final sessions.

Teacher 3 maintained low percentages and zero celeration through all phases. Her mean percentages of disruptive behavior were 0 (range, 0 - 3) for baseline, 1 (range, 0 - 7) for intervention, and 2 (range, 1 - 3) for maintenance. Teacher 4's data showed acceleration towards the end of baseline and variable data during intervention. Mean percentages for Teacher 4 were 11 (range, 0 - 35) in baseline and 27 (range, 6 - 50) in intervention.

Question 7: To what extent are the teacher participants satisfied with the contextual fit of the goals, outcomes, and procedures of the intervention?

Teachers completed a social validity survey (see Appendix G) on the procedures and results of the study. Overall, analysis of their responses data indicated that teachers felt that the intervention had a good contextual fit with them and their environment. Teachers responded to questions using a 6-point Likert scale with higher scores indicating greater agreement. The mean for questions relating to contextual fit was 5.79 (range, 4 - 6)

Figure 11: Percentage of Total Session Time of Disruptive Behavior

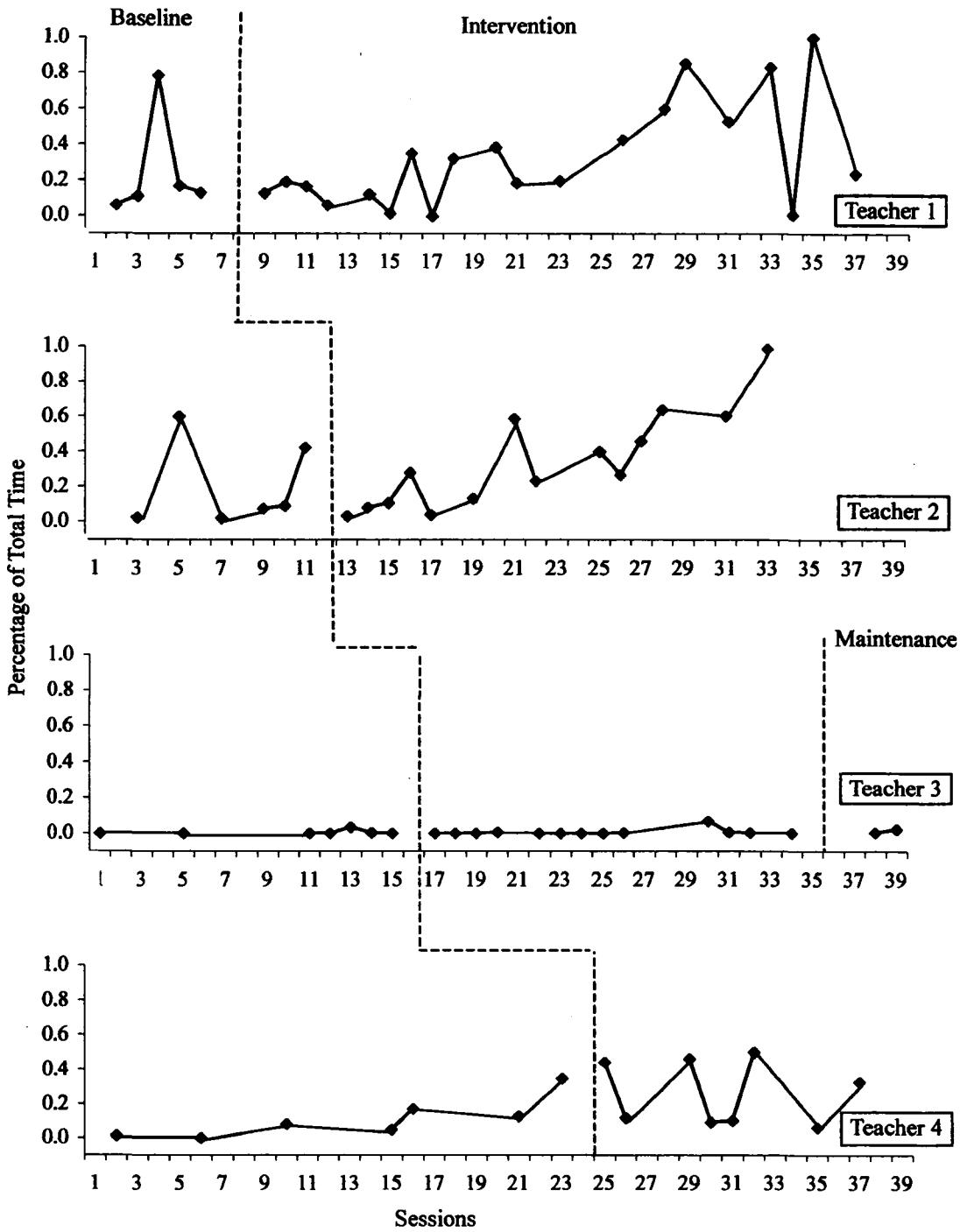


Table 17

Percent of Total Session Time of Disruptive Behavior

Teacher		Baseline	Intervention	[a]Maintenance
1	Mean	25	35	-
	Range	6 – 79	0 – 100	-
2	Mean	21	35	-
	Range	2 – 60	3 – 99	-
3	Mean	0	1	2
	Range	0 – 3	0 - 7	1 – 3
4	Mean	11	27	-
	Range	0 – 35	6 – 50	-
	Overall Mean	13	26	2
	Overall Range	0 – 79	0 - 100	1 - 3

Note. [a] Maintenance data were collected for Teacher 3 only.

indicating that teachers rated the intervention highly. Results are summarized in Table 18. Specifically, they found that goal setting (M = 5.5; range, 4 - 6), feedback sessions (M = 5.75; range, 4 - 6), and performance graphs (M = 5.75; range, 4 - 6) were beneficial.

Data for Question 2 were excluded from mean and range calculations on contextual fit because the wording of the question reversed the Likert scale, with a low score used to indicate high levels of contextual fit. Question 2 read, "I thought the feedback and goal setting sessions were too long". The mean teacher response was 3 (range, 1 - 6).

Table 18

Social Validity Survey Responses on Contextual Fit

Survey Question	*M*	Range
3. I found the goal setting process to be beneficial.	5.5	4 - 6
4. I found the feedback sessions to be beneficial.	5.75	5 – 6
5. I found the performance graphs to be beneficial.	5.75	5 – 6
7. The amount of time and energy to include these teaching behaviors in a lesson is reasonable.	5.75	5 – 6
8. I think these teaching behaviors improved the learning of my students.	6	
9. I think these teaching behaviors improved the behavior of my students.	6	
Subtotal for Contextual Fit	5.79	4 – 6
Total Survey Results for All Questions	5.71	4 – 6

Teacher3, who scored *6 Strongly Agree* for this question, reported verbally that the sessions were quick and easy to fit into her schedule. Based on this verbal report and the fact that only one question required respondents to reverse the scale, it is likely that Teacher 3 scored the question incorrectly. Excluding Teacher 3's response, the mean was 2 (range, 1 - 3) indicating on average that teachers disagreed that the feedback and goal setting sessions were too long.

Question 8: To what extent do teacher participants feel better prepared to meet the needs of students with challenging behavior in their classrooms?

Table 19 summarizes teachers' responses on questions relating to feelings of preparedness. Analysis of teacher responses indicated that teachers were aware of the target behaviors (i.e., opportunities to respond, praise, and corrective feedback) prior to participating in the study (M =5; range, 4 - 6). Teachers indicated that they possess the skills necessary to use the target teaching behavior (M = 6). Teachers reported that the intervention increased their feelings of preparedness to use the target teaching behaviors to manage students with challenging behavior (M = 5; range, 4 - 6). They recommended that other teachers receive training in these behaviors (M = 5.75; range, 5 – 6). They also strongly agreed that the target behaviors should be taught in teacher education programs (M = 6). Teacher 3 repeatedly expressed the potential benefit of the procedures for use with student teachers and in teacher mentoring dyads. Finally, all teachers strongly agreed that feedback meetings were effective and easy to understand (M = 6).

Maintenance Sessions

Maintenance data were only collected for Teacher 3. Two maintenance data sessions occurred. Maintenance sessions were conducted two days apart, seven days after the last intervention observation and eight days after the last goal setting meeting. Teacher 3 improved her performance on OTR, ratio of praise to corrective feedback, and her rate per minute of correct academic responses by students. In the last goal setting meeting, Teacher 3 communicated that she saw and understood the benefits of using the effective teaching behaviors consistently. She also communicated her intention to continue to improve her performance even though the intervention was ending.

Table 19

Social Validity Survey Responses on Teacher's Feelings of Preparedness

Survey Question	*M*	Range
1. I was aware of these teaching behaviors before participating in this study.	5	4 – 6
6. I have the skills needed to use these teaching behaviors effectively.	6	
10. Now I will be better able to handle students with challenging behaviors in my classroom.	5	4 – 6
11. I would recommend training in these teaching behaviors for other teachers.	5.75	5 – 6
12. I think training in these teaching behaviors should be included in teacher education programs.	6	
13. The researcher was effective in providing feedback and answering questions (e.g., used language that was easy to understand).	6	
Subtotal for Preparedness	5.63	4 – 6
Total Survey Results	5.71	4 – 6

Summary of Findings

Analysis of the means of participant data and visual analysis of the graphs indicates that performance feedback with goal setting had the strongest impact on OTR and AP.

Both the frequency and rate per minute of OTR increased, though no teacher came close to the pre-established goal of 120 OTR per session. AP increased the most of all teacher behavior. All teachers achieved a 4:1 ratio during at least some sessions. Teacher 3 was able to maintain a mean ratio better than 4:1 for all three phases.

BP and corrective feedback for academics and behavior demonstrated less improvement. BP frequency and rate were low in baseline and remained low for all participants during intervention. BCF occurred more frequently and at higher rates in baseline and there was an overall increase in BCF means during intervention. The target ratio of 4:1 praise to corrective feedback was not achieved by any of the teachers. ACF occurred less frequently and at lower rates than BCF, but in a more balanced ratio.

Changes in Teacher's use of OTR had a positive effect on the rate per minute of students' CAR. The mean percentage of correct responses was high across phases. A treatment effect is evident in the rate per minute CAR data, which increased during intervention, and maintained a pattern similar to OTR.. The frequency of disruptive behavior declined during intervention but these data were misleading as the percentage of total session time in which disruptive behavior occurred actually increased.

Teachers reported that the procedures were beneficial and easy to use. Although they were familiar with the target behaviors prior to the study, they did not engage in these behaviors systematically. In particular, they found the graphs a highly useful form of feedback. Finally, they thought that the process would be useful for other teachers and student teachers.

CHAPTER 5

DISCUSSION

The purpose of the study was to examine the effectiveness of performance feedback with goal setting on classroom teacher's effective teaching behavior and to examine the impact that changes in teacher behavior had on student behavior. This chapter presents a discussion of the results of the eight research questions. The limitations of the study are considered, followed by practical implications of the findings. The chapter closes with suggestions for future research and a concluding summary of the study.

Discussion of Findings

The eight research questions that were answered in this study are presented below. The results for each question are summarized and followed by a related discussion. Because maintenance data were collected for only one teacher, the results of those data are discussed in a separate section after the last research question.

Teacher Behavior

Question 1: Does training teachers to read performance feedback graphs and engage in goal-setting increase their frequency and rate per minute of opportunities for student responses?

An analysis of the data for Question 1 indicated that performance feedback with goal setting increased the mean rates of OTR for three teachers between baseline and intervention. Teacher 4 demonstrated a smaller increase in OTR but her intervention data presented a more stable rate across sessions in comparison to baseline. Rates of OTR for Teachers 1, 2, and 3 were highly variable across intervention. The reason for this may be that these teachers varied their lesson formats frequently, whereas Teacher 4 followed a more predictable pattern during each period. Because of the unpredictable lesson format, teachers spent more time organizing and directing students and less time delivering instruction.

Teachers 1, 2, and 3 also engaged in a greater amount of what Sutherland, Wehby, and Yoder (2002) referred to as "other talk" (i.e., talk not related to academics or behavior). Examples of other talk engaged in by the teachers in the current study included discussion about extra-curricular activities, jokes, and anecdotes. While not measured directly, other talk was indirectly captured on the time plot by the absence other teacher behaviors (see Appendix B for a sample time plot). All teachers talked for the majority of the observations sessions, except when students were responding. If teachers stopped engaging students for more than 1 minute (e.g., went and sat at their desk without talking to students), the session was cancelled. Thus, in the intervals between target behavior, teachers were frequently engaged in other talk. Higher rates of other talk are associated with lower rates of OTR (Sutherland et al.). Other talk occurred during baseline and intervention, though it decreased as rates of OTR increased during intervention.

None of the teachers in the current study came close to the ultimate goal of 120 OTR per session. This frequency is the equivalent of 8 OTR per minute. In some sessions,

Teacher 3 and Teacher 4 were able to achieve rates of 3.67 and 3.60, respectively. These were the highest rates achieved during the study, less than half the target rate.

Review of the time plots with teachers during weekly sessions revealed a consistent pattern across participants. Throughout the course of an observation session, there were periods of time when teachers engaged in high rates of OTR and periods of time when few or no OTR were given. Those times when no OTR were given were typically time used by the teacher to organize the next step of the lesson or times when the teacher engaged in *other talk.*

Unlike previous studies on OTR (e.g., Carnine, 1976; Tincani et al., 2005), teachers in the current study did not follow a scripted lesson and instructional content varied considerably from session to session. While this is more realistic of the conditions in general education classrooms, it was likely an important factor limiting the rate of OTR. Following a scripted lesson facilitates a rapid presentation of OTR, whereas teachers who speak extemporaneously might have difficulty achieving high rates (Tincani et al., 2005).

In order to achieve higher rates of OTR, teachers who do not use scripted materials need training on strategies to increase student responding. Three strategies for increasing student responding are choral responding, response cards, and guided notes (Heward, 1994). The benefit of these strategies is that they do not require any special technology and they can be used across a broad range of ages and subjects. This simplicity makes them ideal for teachers in typical general education classrooms.

While teacher participants had lower rates of OTR relative to the research literature, the current results confirm the findings of previous studies on the efficacy of performance feedback with goal setting. First, that daily feedback of teaching performance is effective

for improving performance (Smith & Steffan, 1994). Second, that performance feedback with goal setting is effective for increasing the amount of instruction given by teachers (Miller et al., 1995; Sharpe et al., 2002).

Question 2: Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of academic praise and corrective feedback?

Findings indicated that intervention produced an increase in AP for all teachers while ACF remained fairly constant across conditions. During baseline, AP and ACF occurred at similar levels for each teacher. After performance feedback with goal setting began, data for AP fractionated from ACF and maintained higher levels through intervention. There was one exception to this in Session 32 for Teacher 3, in which ACF occurred at a higher rate. The reasons for this anomaly were unknown.

Increasing rates of OTR and AP increases students' academic achievement (Broden et al., 1970; West & Sloane, 1986). All teacher participants agreed with the importance of providing immediate feedback to students following an answer; either praise for a correct response or correction for an error. During the goal meetings teachers communicated an understanding of this principle and stated that they found it relatively easy to remember to deliver AP and ACF for student responses.

Delivery of AP and ACF was contingent upon specific student behavior. The increase in AP may have been related to the increase in OTR and correct academic responses. As the rate of OTR increased during intervention, the number of correct responses also increased. Thus, teachers were presented with a greater number of opportunities to deliver AP. Since correct responses were effective prompts for teachers to administer AP, rates of AP increased in accordance with rates of correct responding.

The increase of ACF, though much smaller than the increase of AP, was also likely related to student responses, in this case incorrect responses. ACF could only be delivered after an incorrect student response. Thus, low rates of ACF were not necessarily problematic if they were due to a high percentage of correct responding. As was demonstrated in Chapter 4, students maintained a high percentage of correct responding throughout the study. Therefore, a small increase in frequency of ACF is expected as a result of the increase in OTR but low levels of ACF overall correspond to the high degree of accuracy in student responses.

As with OTR, results for AP and ACF support previous research on performance feedback with goal setting. Mesa et al. (2005) also found performance feedback increased teacher's use of praise. Brawdy and Byra (1995) found that performance feedback with goal setting increased teachers use of positive specific feedback for task related behavior, a target behavior was operationally similar to AP. Furthermore, as with the current findings, they also found very little increase in the amount of corrective feedback given.

Question 3: Does training teachers to read performance feedback graphs and engage in goal-setting increase their use of behavioral praise and corrective feedback?

Outcome data do not support a functional relationship between the intervention and teachers' use of BP and BCF. Teachers 1, 2, and 4 exhibited higher rates of BCF in baseline and intervention. Overall, there was a small increase in the mean rate of BCF used in intervention over baseline. Teacher 3 exhibited similar rates of BP and BCF during baseline. During intervention, she decreased her use of BCF slightly though BP continued near baseline levels.

Delivery of BCF was contingent upon disruptive student behavior and was therefore a reactive behavior by the teacher. Teacher 3 demonstrated more proactive management behavior than the other teachers. For example, she met students at the door of the classroom every day and, as they entered, told them what to get ready for the lesson. This proactive style may have influenced student behavior and been a reason for her infrequent use of BCF across baseline and intervention. The other teachers, in response to sustained disruptive behavior, would cease other teaching behavior and deliver multiple BCF consecutively, sometimes yelling or lecturing as well, before returning to the lesson. These behavior patterns may explain their higher rates of BCF.

All teachers presented low rates of BP and used it only sporadically. Teachers had multiple sessions during the intervention condition in which they did not deliver any BP or delivered it only once. Consistent and accurate application of behavioral procedures is critical in order to affect student behavior change (Kazdin, 1982). The lack of consistency made the contingencies for BP unclear and this may be one reason that disruptive behavior did not decrease.

During goal meetings, teachers expressed more difficulty with BP than with the other target behaviors. Teachers 1 and 2 could not self-generate strategies for increasing their use of BP, which they were able to do for OTR, AP, and ACF. Teacher 1 was not receptive to suggested strategies and was less attentive during those parts of the discussion. As a result, less time was spent discussing BP and BCF which may have contributed to the lack of effect for those behaviors.

Teacher 2 was convinced that he was delivering BP more frequently than he was and was continually surprised by his data. When asked, he could not provide specific

examples of what he thought he was delivering. However, he was receptive to strategies on how to increase his use of BP and how to use BCF more effectively. Nonetheless, he implemented more of the strategies for improving his use of BCF than for those of BP.

Teachers 1 and 2 communicated, at various times, the misconception that students did not need to be praised for appropriate behavior because appropriate behavior was a basic expectation for school. This demonstrates a lack of understanding of a basic SWPBS principle (Sugai & Horner, 2002) and suggests that these teachers were not proficient in their knowledge of the behavioral concepts the school had adopted. As a result of this belief, they asked fewer questions and spent less time reviewing data about BP. Because the goal meeting procedures were partly influenced by the dialogue generated by the teachers, it is possible that a significantly different amount of time was spent on BP and BCF than the other target behaviors. The difference in time spent on feedback and discussion may, therefore, have been insufficient to change teacher behavior. Data collected for the current study do not allow for this type of analysis, but future studies should more carefully control the amount of intervention time allocated to each behavior.

Results for BP do not corroborate results from previous studies on performance feedback with goal setting. The reasons for this, as discussed, are unclear. Nonetheless, two possible explanations for the current findings can be derived from that literature. First, goals based on performance data were established as more efficacious than self-selected goals (Miller et al., 1995). It is possible that the use of a ratio instead of a specific frequency, as with OTR, made the data more obscure and the goal correspondingly more difficult to obtain. While a ratio goal was also used for AP and ACF, there was a discrete cue for these behaviors (i.e. student responses) that facilitated

teachers' use of them. Additionally, during feedback meetings, instances of student responses that were not followed by AP or ACF were highlighted as potential areas for improvement. Because data were not collected on appropriate student behavior, specific instances of missed opportunities to deliver BP could not be shown in the data.

Second, Miller and colleagues (1995) also noted that it was more difficult for student teachers to increase behaviors not in their repertoire than to maintain ones that were. As was evident in baseline data, BP occurred at near zero levels for Teachers 1, 2, and 4. Accordingly, it is possible that BP was not a mastered skill and that, without additional training, teachers found it difficult to increase their use of it.

Question 4: Are teachers who receive performance feedback graphs and engage in goal setting able to achieve and maintain a ratio of 4:1 praise to corrective statements?

The findings of this study indicate that achieving and maintaining a ratio of four praise to one corrective statement was difficult for all participants. Teachers 1, 2, and 4 were able to achieve ratios at or better than the target ratio for some sessions for AP and ACF though their intervention means were below 4 to 1. Teacher 3 achieved a 4 to 1 ratio for AP to ACF in baseline and improved this ratio during intervention and maintenance. Although the ratios for BP to BCF improved slightly during intervention, none of the teachers came close to the target ratio for BP and BCF. The highest ratio during any intervention session was 1.3 to 1.

As discussed above for Question 2 and Question 3, teachers found it much easier to increase delivery of AP than BP during intervention. Teachers 1, 2, and 4 used BCF at high rates and all teachers used BP at low rates across conditions. Given the analysis of the findings of those individual questions, the results for the analysis of praise to

corrective feedback ratios are not surprising. All teachers found the 4:1 ratio daunting in relation to behavioral statements. They were not intimidated by the ratio in relation to academic statements. Despite a single question on the goal form, they began to differentiate their goals for the ratio to be achieved for academics and behavior. For example, Teacher 4 set the goal of a ratio of 3:1 for AP to ACF but a ratio of 1:2 for BP and BCF. These goals were intended to help her gradually shift the existing ratio of praise to corrective feedback in her classroom.

Student Behavior

Question 5: To what extent does increasing the teacher's rates of target behavior result in an increase of students' percentage of correct academic responses?

Results revealed little change in the percentage of correct academic responses between baseline and intervention. Given the high percentages of correct responses in baseline, it is likely that a ceiling effect occurred, as there was little room to improve performance. Teacher 2 had the lowest percentage of correct responses in baseline. The reason for this may have been his practice of allowing multiple students to attempt an answer before providing any feedback. In the absence of a confirmed correct response, students would sometimes continue to try different responses and each incorrect response was scored. During intervention, Teacher 2 learned to provide more immediate feedback and eliminate the prolonged guessing by students.

Another factor influencing the percentage correct for Teachers 1 and 4 was the difficulty students with limited English proficiency (LEP) had in learning new vocabulary. Both teachers, when introducing new vocabulary, would have students repeat the words until they could pronounce them accurately. This often required multiple

repetitions, resulting in multiple incorrect responses being recorded. Thus, a lower percentage of correct responses was calculated for those sessions though it may disguise the actual learning that occurred. Future investigations should include measures of student performance as an added variable.

The outcome for percentage correct stands in contrast to the data on the mean rate per minute of correct academic responses, which increased for all teachers during intervention. Teacher 1 and Teacher 3 demonstrated the greatest increases. Increases for Teachers 2 and 4 were more modest. Increasing OTR increases the opportunities for student responses, an indicator of student engagement (Sutherland & Wehby, 2001). In the current study, when the rate of OTR increased and the percentage of correct responses maintained high levels, the rate per minute of correct responses increased as a result.

Despite these increases, rates of correct student responses were far below levels recommended in the literature (Carnine, 1976; Tincani et al., 2005). Levels in the current study were also lower than those found to typically occur in elementary general education classrooms (Gunter, Reffel, Barnett, Lee, & Patrick, 2005). The reason for this may be partly due to the differences between elementary and middle school classrooms. However, the fact remains that rates of correct student responding were lower than the minimum that Carnine indicated were necessary to enhance student achievement.

Question 6: To what extent does increasing the teacher's rates of target behavior result in a decrease of students' rates of disruptive behavior?

An analysis of the data on disruptive behavior revealed that although there was a decelerating trend in frequency, the overall percentage of total session time in which disruptive behavior occurred doubled during intervention. The exception to this finding is

the data for Teacher 3, whose students' disruptive behavior remained at low levels across baseline and intervention. The data on disruptive behavior were influenced by the presence or absence of specific students in each class. Each day there was at least one student absent, from class. There were one to three students in each class who frequently missed class because they were in the dean's office as a consequence for inappropriate behavior or were suspended for such behavior. Anecdotally it was noted that students who engaged in disruptive behavior in class were more frequently absent than those students who did not. Since disruptive behavior was recorded with the class as the unit of analysis, it was not possible to evaluate the behavior of individual students over time. Future research should include procedures that allow for measurement of individual student behavior.

Prior research has indicated that an increase in OTR and praise can reduce disruptive behavior (Sutherland et al., 2002). However, these studies used much higher rates of OTR and only evidenced small decreases in disruptive behavior (Carnine, 1976; Tincani et al., 2005). Given those findings, it is not surprising that the current study failed to find a decrease in disruptive behavior with the relatively low rates of OTR achieved during intervention.

This study lends support to the assertion in the SWPBS literature that good classroom instruction is insufficient to significantly decrease disruptive behavior (Sugai et al., 1999). The classroom level procedure used in this investigation does not take the place of individualized intervention procedures. An effective model for intervention must combine good instructional design with behavioral management procedures for groups and individual students (Sugai & Horner, 2002). School staff and students require a

continuum of behavioral support, extending from general rules to classroom procedures to functional behavior assessment for students with the most severe behavior problems (Sugai et al., 1999). The current procedures did not provide teachers with the additional training they required to gain a better understanding of the behavioral principles involved with effective use of BP and BCF nor did it provide them sufficient opportunities to learn new strategies for implementation.

Social Validity

Question 7: To what extent are the teacher participants satisfied with the contextual fit of the goals, outcomes, and procedures of the intervention?

Social validity assessment indicated that all teachers found the goal setting and feedback meetings beneficial and the performance data graphs especially meaningful. There was also strong agreement among the teachers that the amount of time required to include the target behaviors in their lessons was reasonable. This is an important finding because teachers must be able to use instructional technology with relative ease in order for the benefits of that technology to be passed on to their students. Teachers in this study felt that the target behaviors enhanced their instruction and did not distract them from the lessons. Teachers were unanimous in their strong agreement that the target teacher behaviors improved the learning and behavior of their students. As mentioned above, future studies should include measures of student performance to determine the relationship between these behaviors and student achievement.

It was interesting to note that teachers felt the behavior of their students improved, even though the percentage of time disruptive behaviors occurred increased during intervention. Again, a more detailed analysis of changes in student behavior was

prevented by the manner in which disruptive behavior was measured. During each session for Teachers 1, 2, and 4, some students were attending and participating and some students engaged in disruptive behavior. Whether the ratio between those groups changed over the course of the study is unknown. However, anecdotally teachers reported that they perceived more students attending and participating despite the recalcitrant behavior of some students. This perception could have been because some, though not all of students were engaging in higher rates of participation and lower rates of disruption.

Question 8: To what extent do teacher participants feel better prepared to meet the needs of students with challenging behavior in their classrooms?

Social validity assessment also revealed that teachers felt that performance feedback with goal setting increased their feelings of preparedness. They agreed the procedures were user-friendly. Although they were aware of the teaching behaviors prior to the study, none used them consistently during baseline indicating that awareness of instructional strategies was not sufficient for adequate performance.

At the end of the study all teacher participants strongly agreed that they had the necessary skills to implement the teaching behaviors. Teachers also agreed that the study improved their ability to handle students with challenging behavior. This result corresponds with their perception that student behavior improved, though both stand in contrast to the actual data on disruptive behavior. The reason for this disconnection between teachers' perceptions and behavior data is not clear. Future studies could be designed to examine the relationship between teacher's perceptions of student behavior and actual behavior events.

All teachers agreed that training on the target behaviors would benefit inservice and preservice teachers. Teacher 3 spontaneously identified potential applications of the procedures during her goal setting meetings. She was enthusiastic about the potential for the procedures to positively change the way feedback was given to new teachers and student teachers.

Maintenance

Maintenance data were only collected for Teacher 3 due to the schedule constraints resulting from the end of the school year, prior absences of other teacher participants, and the extended nature of the multiple probe design (Horner & Baer, 1978). Teacher 3's performance of the target teaching behaviors improved significantly during maintenance. Although the limited number of data points precluded the conclusive establishment of a trend, the increases in mean rates and ratios were pronounced. The reason for her performance may be related to her motivation. During the final goal setting meeting, Teacher 3 reported that she was very pleased with the changes she noticed in her students and that when she applied the target behaviors to her other classes, the improvement was evident there as well. She said she was determined to continue to improve, even without feedback and goal setting. However, the actual reasons for her performance are unclear.

Maintenance of intervention effects for performance feedback with goal setting has not been adequately studied. Prior to the current investigation, only one study included a maintenance condition (Sharpe et al., 2002). Sharpe and colleagues also found that after feedback from a supervisor was discontinued, the mean rates of target behaviors continued at intervention levels during maintenance sessions. The researchers indicated that more research into the variables affecting performance during maintenance was

required. They suggested that the length and number of feedback sessions may be an important factor influencing performance. The current study contained two maintenance sessions, future research should include more comprehensive maintenance procedures to evaluate the durability of behavior change. Additionally, investigation of teachers' ability and accuracy generalizing target behaviors to other settings is necessary.

Limitations

Participants

Selection procedures may have influenced participant behavior. The administrator nominated two of the participants, Teacher 1 and Teacher 2, for participation because they were reported to have weak classroom management skills. Baseline and intervention data revealed that Teacher 1 and Teacher 2 had more disruptive behavior than Teacher 3 and Teacher 4. Although the decision to participate was voluntary, the skill deficit plus communication with the administrator regarding these difficulties could have affected their performance in the study.

In contrast, Teacher 3 and Teacher 4 volunteered to participate in the study because they were interested in learning about the application of procedures that could be used to help future teachers who struggle with instruction and management. Their enthusiasm and motivation to learn about the intervention may have also influenced their performance.

Setting

The setting of the study, an urban public middle school, was subject to at least two factors that may have threatened internal validity. First, school staff members were in

their third year of a SWPBS project. This project included inservice activities about the importance of effective behavior and instructional management. Discussions of effective classroom environments were part of the regular dialogue of weekly staff meetings. These environmental factors may have influenced teachers' receptivity to and motivation for participating.

Second, the timing of the study in the last quarter of the school year resulted in numerous interruptions to the schedule, including standardized tests, final exams, and promotion assemblies. Changes in schedules are common in schools throughout the year, though perhaps more frequent in the final weeks of school As a result, teachers were less structured with their lessons when multiple disruptions occurred in the same week. This may have contributed to the fluctuation in teacher performance. While doing research in real classroom environments presents certain threats to internal validity, it also enhances the generalization of results to typical classroom settings in which disruptions to normal routines are to be expected.

Intervention Factors

Both components of the intervention were subject to limitations that may have influenced their efficacy. First, the duration of feedback and goal setting meetings varied across participants as a function of their questions and observations. The variation in duration may be related to changes in performance. For example, Teacher 1 consistently had short meetings because she engaged in very limited discussion and asked few questions. She also had the lowest means for OTR and AP.

Second, the amount of time within meetings spent on each target behavior and goal area varied according to participant dialogue. Each behavior and goal area was reviewed

and discussed. If the teacher did not ask questions or contribute to the discussion the meeting could be completed in approximately 9 min. While teachers were encouraged to participate actively in the discussion, responses could not be forced. Future research could include a more systematic format for meetings to reduce variability.

Third, the discussions during the meetings were another source of variability. In addition to differences in the amount of time spent on each behavior, the number and type of suggestions varied as a function of teacher's questions and needs. For example, Teacher 3 engaged in conversation about BP, discussed strategies for use, and spontaneously shared her preference for BP over BCF. In comparison, Teacher 1 did not ask questions about BP, appeared disinclined to believe in its efficacy, and stated that it had not worked for her in the past. As a result, more suggestions on the use of BP were given to Teacher 3 than Teacher 1. An unintended consequence of this meeting format was that teachers could escape discussion of non-preferred target behavior by not asking questions.

Fourth, teachers' responses to their performance varied according to which target behavior was being discussed. Teachers verbally communicated greater confidence in their ability to increase OTR and to administer AP after a correct response or ACF after an incorrect response. However, most of the teachers were less confident in their ability to use BP and BCF effectively. They expressed greater skepticism at the value of BP (e.g., *Praising students won't get other students to behave*). Teachers 1, 2, and 4 also expressed surprise at the amount of BCF they used. Teacher 2 commented that he thought he was using BP much more than he was. Teacher 1 stated that she thought BCF was the

most effective thing to do when she lost control of her students and that other strategies were not effective. BP and BCF were consistently the most difficult behaviors to change.

Although meetings included a discussion of how to increase the target behaviors, they did not include systematic training in behavior management techniques. The purpose of the intervention was to use performance feedback with goal setting to improve performance of existing skills. Even though teachers displayed all the target behaviors during baseline, it became evident that they did not all have sufficient mastery of some behaviors in order for feedback with goal setting to make an appreciable difference. For example, Teacher 1 and Teacher 2 understood BP but were not fluent enough with the behavior to generate strategies for use or be comfortable using suggested strategies. Future studies could compare the effects of performance feedback with goal setting combined with professional development and training in specific teaching skills.

Data on Disruptive Behavior

Disruptive student behavior was measured by observing the class as the unit of analysis. When a disruptive behavior occurred, duration recording began. Duration recording did not stop until there were no incidents of disruptive behavior occurring in the classroom. Typically, more than one student would engage in disruptive behavior at the same time. This often led to long chains of disruptive behavior. For example, one student would engage in disruptive behavior and other students would join in. The first student would stop but since other students continued to be disruptive, the duration recording continued. Meanwhile, other students could be actively and appropriately engaged in the lesson. Thus, it was possible to record high levels of student responding and high levels of disruptive behavior simultaneously.

While high rates of opportunities to respond have been demonstrated to decrease disruptive behavior (Carnine, 1976; Tincani et al., 2005; West & Sloane, 1986), these effects were not replicated in this study. Because data could be collected on different students at the same time, disruptive students and participating students were frequently different people. As such, the response categories for student responding and disruptive behavior were not mutually exclusive. Future research should examine the rates of engagement, correct responding, and disruptive behavior of select students in order to more accurately evaluate the effects of teacher behavior on student performance.

Variability

The variability in the data was another a limitation. The variability in participant data indicates that some influential variables remained uncontrolled. Some of the variability may be an artifact of behavioral observation. Another potential source of variability was the rotating block schedule, which meant that teachers were observed at different times of the day. Variable performance may be related to the time of day sessions were conducted. Also, once every six days, teachers taught all day without a prep block. This may have been another source of variability since teachers did not get a break and may have been more tired.

A potential source of variability in the OTR data was the real classroom setting and lack of scripted materials. Real classrooms are subject to frequent disruptions to routines and do not operate like an analogue environment. The myriad of activities occurring in the classroom frequently caused the teachers to divert their attention from delivering instruction, causing brief interruptions in the delivery of OTR. In addition to these

distractions, the lack of scripted materials made it more difficult to teachers to establish a steady pacing of OTR and maintain that pace throughout the session.

Maintenance and Generalization

Only two data points were obtained for maintenance of one participant. This limits the conclusions that can be drawn from this data. Additionally, this study did not assess generalization of teacher behavior to other settings, specifically other class periods. The block schedule of the middle school limited the number of sessions available in one day and it was therefore impossible to observe teachers in other periods. An assessment of the generalization of behavior change is necessary to determine wider effects, if any, of the intervention. Data on generalization is particularly important in order to fully understand the practical implications of the use of performance feedback with goal setting with teachers.

Outside Observers

A final limitation of this study was the use of graduate students to conduct the observations and goal setting meetings. Observers were unknown to three of the teachers prior to the study. One teacher knew the primary observer from attending training sessions conducted by the primary observer the previous year. The results of the study were not related to the teachers' supervisors. This meant that there were no contingencies on teacher performance outside of the study procedures, such as annual evaluations or tenure reviews. This may have resulted in a more casual approach to the feedback and goal setting than if an existing supervisor had been involved. In a more naturalized arrangement, observations would be conducted by existing school personnel, for example a teacher's supervising administrator.

Practical Implications

Teacher Performance

Increasing teachers' use of OTR and contingent praise can increase student engagement (Carnine, 1976; Skinner et al., 1994; Tincani et al., 2005), enhance academic progress (Englert, 1984), and lower rates of disruptive behavior (West & Sloane, 1986). The inconsistent results among Teachers 1, 2, 3, and 4 indicate that the effects of performance feedback with goal setting may vary according to characteristics of individual teachers, how feedback and goal setting are conducted, and the behaviors being targeted. Teachers in the current study had varied experiences and training in instructional and classroom management. They also differed in their years of experience working in a challenging urban environment. Additionally, the findings indicate that rates of OTR and AP exhibited the greatest increases, while rates of BP evidenced the least change. In deciding to use performance feedback with goal setting, the skill level of teachers and the specific teaching behaviors targeted should be considered carefully. The use of additional training procedures may be necessary. For example, teachers like those in the current study who have little skill in praising students for appropriate non-academic behavior may need to receive modeling and feedback on their use of behavioral praise as they teach, in addition to graphical feedback and goal setting after the lesson. Without additional training, feedback and goal setting alone are unlikely to be effective.

Student Behavior

Reducing disruptive behavior benefits all students by creating a safer environment that is more conducive to learning (Sugai et al., 1999). The tiered intervention approach advocated by SWPBS includes a continuum of behavioral support, ranging from school-

wide, universal expectations to individualized behavior plans. The universal and individual components, such as school-wide reward systems and functional behavioral assessments, are well described in the literature (Kern & Manz, 2004). The classroom component of this continuum has not, as of yet, been well described. This is unfortunate because general educators are primarily responsible for the instruction and management of most classrooms, and they are not adequately prepared to teach students effectively (Ayres et al., 1993; Meister & Melnick, 2003). Performance feedback with goal setting is one procedure that can assist general education teachers to improve their teaching skills to address the needs of their students.

The demographics of students in this study varied across teachers. Teachers 1 and 2's classes included students with chronic challenging behavior, whereas Teacher 3's class did not. This is reflected in the data by the substantially different levels of disruptive behavior across the classrooms. Instructional design and low levels of behavioral praise and corrective feedback are unlikely to be effective for decreasing all disruptions. Even in classrooms where teachers consistently demonstrate effective instruction and management, students with chronic and severe problem behavior will continue to require function based behavioral interventions (Sugai et al., 1999).

Model for Support

The results of this study demonstrate that inservice teachers are receptive to performance feedback with goal setting. The intervention was effective for increasing their use of OTR and AP, improving the ratio between praise and corrective feedback, and increasing student's rates of correct academic responses. Based on responses to items

included on the social validity survey, teachers indicated that the intervention was beneficial and that they appreciated the specific data related to their performance.

Given the effects of the intervention and teachers' receptivity, performance feedback with goal setting could potentially be integrated into school settings. Two potential avenues for inclusion suggested by the current participants were annual teacher evaluations and new teacher mentoring programs. School staff, particularly in urban schools, often implement multiple initiatives simultaneously (Utley et al., 2002). School administrators would benefit from an adaptable procedure that could be used to systematically evaluate teacher performance across a variety of conditions. Particularly in an urban school environment, it is critical for school personnel to integrate different initiatives for improving academic achievement and student behavior (Warren et al., 2003). Future studies should be designed to examine the efficacy of these procedures on different behaviors before they are broadly applied in the field, or school personnel could consider an action research project to evaluate outcomes.

Available Resources

In order to implement a system to provide teachers with performance feedback with goal setting, staff will need to be identified and trained to conduct the observations and meetings. The availability of staff to conduct observations may be a challenge given the constraints of district budgets. For this reason, as mentioned before, it may be more advantageous to integrate performance feedback with goal setting into existing evaluation systems.

A system for data collection will also need to be established. The *BEST System*© is publicly available software. School administrators could purchase the *BEST System*© and

a laptop computer to replicate the procedures detailed in this study. The cost of these materials may seem excessive for some school district budgets. However, the expenditures should be balanced against the benefits of implementation. The observation and feedback materials can be used repeatedly with multiple teachers over multiple years, thus improving its cost effectiveness.

Suggestions for Further Research

Rate of Opportunities to Respond in General Education Classrooms

Much of the research on target rates of OTR has focused on the use of scripted instructional materials with students with disabilities or students receiving small group instruction. Recommended rates range from 4 OTR per minute to 12 per minute (CEC, 1997). Some studies on the effects of OTR used even higher rates of presentation (Carnine, 1976; Tincani et al., 2005). Tincani and colleagues (2005) suggested that teachers who speak extemporaneously may not be able to achieve the high rates of OTR possible with a scripted lesson. This suggestion was exemplified in the current study where teachers who did not use a script achieved much lower rates of OTR presentation. However, the use of scripted materials is not essential in order to achieve high rates of OTR. Research on active student responding has identified strategies appropriate to group instruction without the use of scripted materials, including choral responding, response cards, and guided notes (Heward, 1994). As discussed in the previous section on Question 1, the benefits of these strategies include that they (a) require simple technology to implement, (b) are supported by a base of research literature, and (c) have demonstrated good social validity with teachers and students (Heward, 1994).

At present, two main questions regarding OTR in large group instruction settings remain unanswered. First, consideration should be given to the skills required to generate high rates of OTR for teachers who do not use scripted instructional materials. Scripted materials are not available to all teachers. Therefore, it is important to identify the necessary skills for those who teach extemporaneously. As identified in the preceding paragraph, some strategies have already been identified. Future studies could examine the effectiveness of performance feedback with goal setting on an active student responding intervention, such as the use of response cards.

Second, an optimal rate of OTR presentation in large group instruction has not been determined. The dynamics of large group instruction may influence the engagement and learning of students. It is necessary to determine whether the rate of OTR necessary to improve student learning is the same for large as small group instruction.

Improved Goal Setting Procedures

The goal setting procedures used in this study permitted variation in how the meetings were conducted. The length of the meetings varied by a few minutes, the amount of time spent discussing each target behavior varied as a function of teacher questions and discussion, and specific suggestions and feedback also varied. These differences may have had significant effects on teacher performance. Subsequent studies on performance feedback with goal setting should standardize the duration of meetings, the amount of time spent discussing the target behaviors, and the specific discussion items and suggestions given to teachers based on their performance and goals.

Other Teacher Behaviors

The current study evaluated the effects of performance feedback with goal setting on a limited number of teacher behaviors. Teachers use a wide variety of instructional and behavioral management skills in the course of a day. Future investigations should evaluate the efficacy of these procedures on other teacher behaviors that are supported in the research literature, including instructional strategies and behavior management.

Student Behavior

The disruptive behavior of individual students was not evaluated in the current study; instead the class was established as the unit of analysis. A limitation of this procedure was that improvement or deterioration in the behavior of individual students was not apparent. Two of the findings suggest that the data measurement procedures may not have been sufficiently accurate. First, rates of student responding increased concurrently with the percentage of disruptive behavior. Second, in the social validity survey teachers reported they perceived an improvement in student behavior that was not detected by the data. Given these findings two questions should be addressed in future studies. First, investigators should examine whether changes in the rate of OTR and teacher praise effect the ratio of the number of students appropriately engaged to the number engaged in disruptive behavior. Second, investigators should explore the relationship between teacher's perceptions of student behavior and actual behavior events.

Student Performance

The current study did not include an evaluation of the effects of the intervention on student performance. As previously noted, measures of student responses and disruptive behavior provided only a global picture of class behavior. Moreover, the

measures do not provide information on student learning. The purpose of high rates of student engagement is to improve academic achievement. Student learning should be evaluated to determine the relationship between teacher performance, student engagement, and achievement. Direct measures of student performance could include number of assignments completed, accuracy of assignments, academic tests, and standardized assessment data.

Durability and Generalization

Maintenance data were collected for one participant in the current study and only one other study on performance feedback with goal setting included a maintenance condition (Sharpe et al., 2002). Generalization has not been assessed in the current or previous studies. Future studies should identify the relevant factors for successful generalization and maintenance of teacher behavior change. Some of the variables to be explored include (a) the number of performance feedback with goal setting sessions necessary to effect durable behavior change, (b) the optimal duration of observation sessions and goal meetings, and (c) the skills required to accurately generalize new behavior to another setting.

Training for Teachers

This study evaluated the effects of performance feedback with goal setting on existing teacher behavior. Detailed training on skills and strategies was not provided to the teachers. It became apparent through the goal setting meetings that some teachers would have benefited from more formal instruction on certain teaching behaviors, particularly for BP. Future studies should examine the combined effects of training plus performance feedback with goal setting. This complimentary intervention may be required when

teachers have deficient skill areas. Instruction plus feedback approximates the procedures used in the studies with student teachers, as they were typically enrolled in concurrent seminar classes. Future investigations should develop a model to provide inservice teachers with training and performance feedback with goal setting.

Effects on Stress and Retention

As discussed in Chapter 1, difficulties with classroom and instructional management represent significant sources of stress for teachers (Lewis, 1999; MacPherson-Court et al., 2003). The purpose of the current study was to investigate a procedure for addressing some of the skill deficits that teachers identify as top priorities. Future research should include longitudinal studies on whether providing performance feedback with goal setting and increasing teachers' skills reduces stress. Further, researchers should investigate whether either improved skills or access to performance feedback with goal setting results in improved retention rates for teachers.

Summary

This study involved an examination of the effectiveness of performance feedback with goal setting on classroom teachers' effective teaching behavior. Also examined was the impact that changes in teacher behavior had on student behavior. Additionally, teachers were surveyed at the completion of the study about their perceptions about the goals and efficacy of study procedures and the degree to which they felt they and their students benefited from the intervention. Participants were four general education teachers in an urban public middle school. All sessions were conducted within the teachers' classrooms.

Teachers were observed for 15 minutes, four to five times per week, teaching one of their classes. During baseline, teachers were observed and incidents of teacher and student target behavior were recorded. Teacher target behaviors were opportunities to respond, academic praise, academic corrective feedback, behavioral praise, and behavioral corrective feedback. Student target behaviors were correct academic responses, incorrect academic responses, and disruptive behavior. Teachers did not receive any information about their performance during baseline. Observations continued during intervention (i.e., performance feedback with goal setting). Teachers were taught to read performance feedback graphs and set goals based on their performance. Teachers participated in weekly goal setting meetings and received performance feedback graphs after every observation. Maintenance data were collected for Teacher 3. Baseline procedures were followed during maintenance.

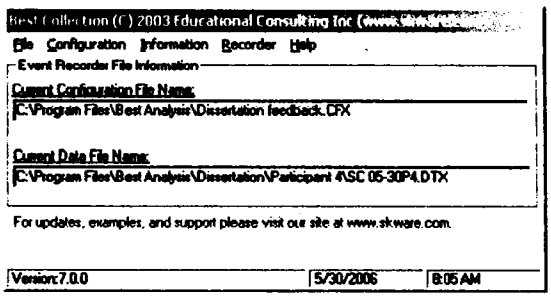
Teacher and student behavior were measured during baseline, intervention, and maintenance. Data were analyzed using the *BEST© System*. For three teachers, performance feedback with goal setting increased their frequency and rate per minute of opportunities to respond and academic praise. For all teachers, behavioral praise remained low, at or near baseline levels. Behavioral corrective feedback increased overall from baseline to intervention, except for Teacher 4 who decreased her use. The percentage of correct academic responses was high in baseline and intervention, with some evidence of a ceiling effect. The rate per minute of correct academic responses increased alongside increases in opportunities to respond.

Results of the current study suggest that the efficacy of performance feedback with goal setting varied across target behaviors and participants. Relevant variables included

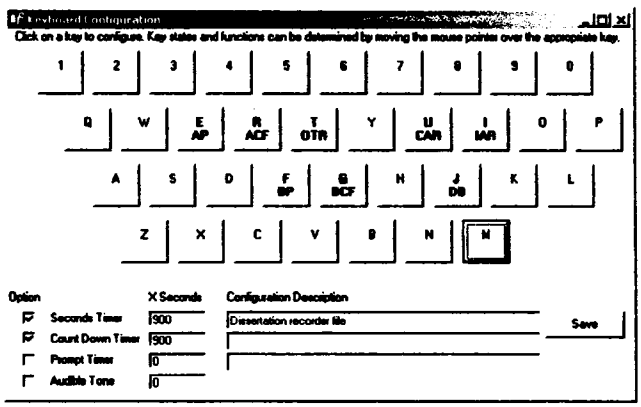
teacher and student characteristics, as well as the teaching behavior being targeted. Further research of these variables should be conducted to determine the most effective use of performance feedback with goal setting for inservice teachers. Specifically, future studies should include consideration of optimal behavior rates, student achievement, durability and generalization of behavior change, and the effects of intervention on teacher stress and retention.

APPENDIX A

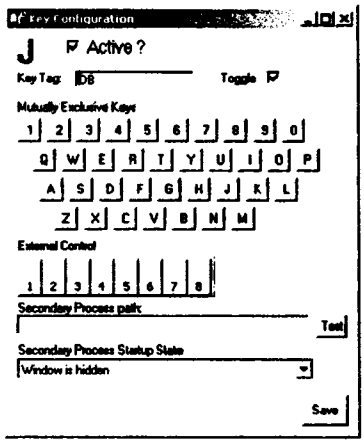
BEST© SOFTWARE



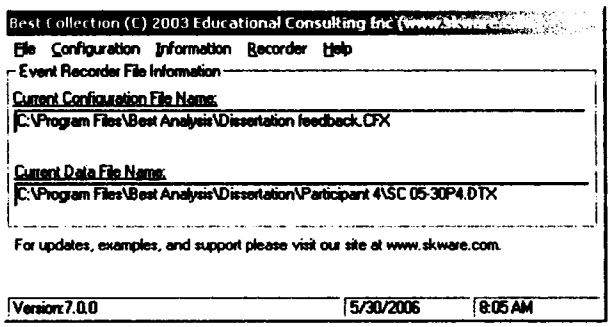
The *Best System*© is comprised of two parts, *Best Collection*© and *Best Analysis*©. The *BEST Collection*© program was used to create a keyboard configuration file for recording behavior events prior to the study.



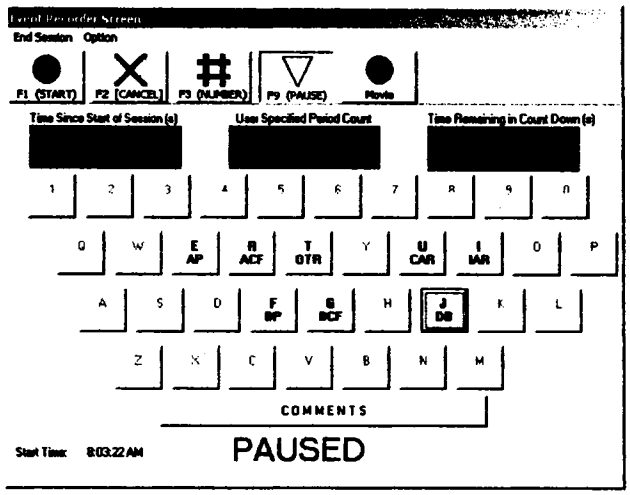
In developing a configuration file, the user assigned one target behavior to one key on the keyboard. The number of seconds for the countdown timer was also specified. The user used the computer mouse to click on one of the keys in the above window.



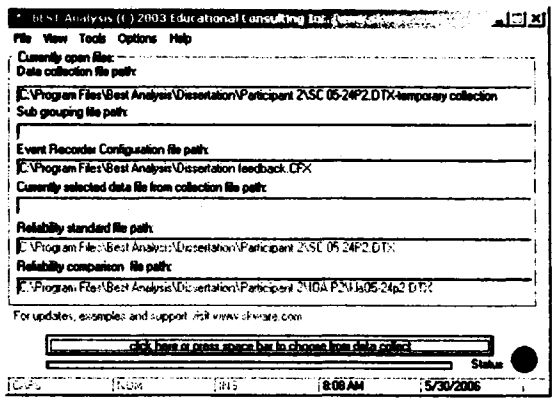
The above window is an example of the individual key configuration window. The *Active?* box was checked to activate the J key in the configuration file. The key tag DB was an abbreviation for disruptive behavior. *Toggle* enabled duration recording (i.e., pressing the J key once began duration recording and pressing it a second time ended recording). No mutually exclusive keys were selected, allowing for the simultaneous recording of other target behaviors. Once completed, the settings were saved and the user returned to the keyboard configuration window to select another key.



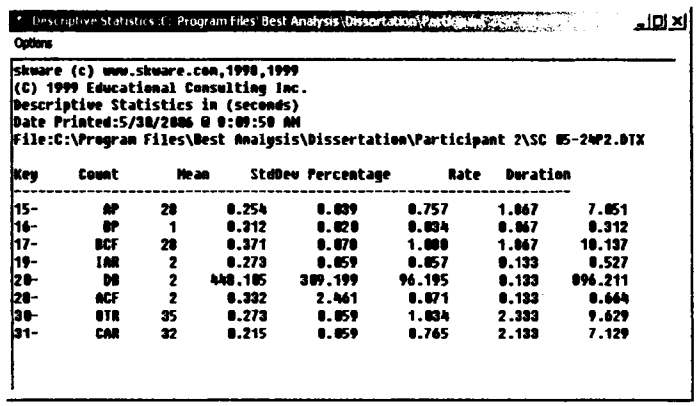
Once the all keys were configured, the user returned to the opening window of the *BEST Collection*© program. Using the Recorder menu, the user could open the event recorder screen.



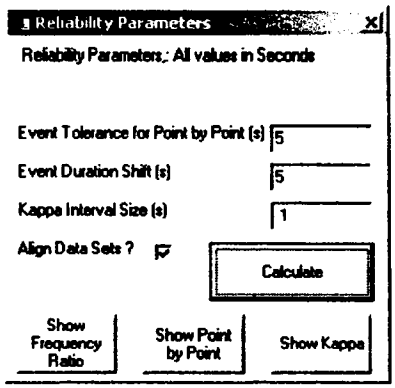
The event recorder screen displayed the following. At the top were the buttons to begin, end and pause the session. The movie button linked to sample videos on the Internet. Below these buttons were three windows displaying various timers. The the Time Remaining in Count Down window was used during this study. The remainder of the window displayed the configured keyboard. The programmed keys had black type and the behavior code abbreviations. Other keys were grayed out. Pressing the space bar at any time during the recording session produced a separate window in which anecdotal comments could by typed. At the end of the session, the data file was saved for analysis.



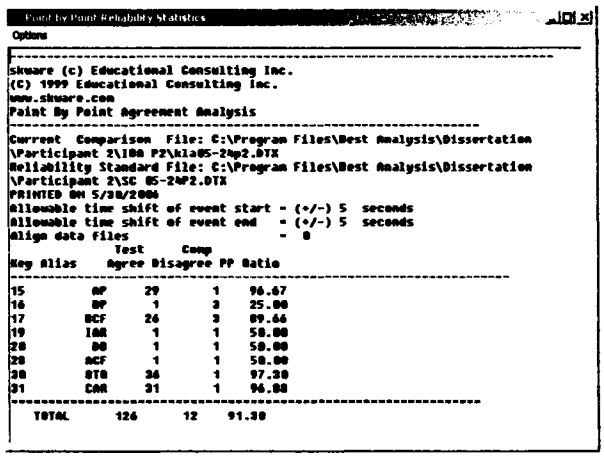
The *BEST Analysis*© program allows the user to identify the Data Collection, Recorder Configuration, Reliability Standard, and Reliability Comparison files for analysis. Analyses can conducted for one Data Collection file at a time.



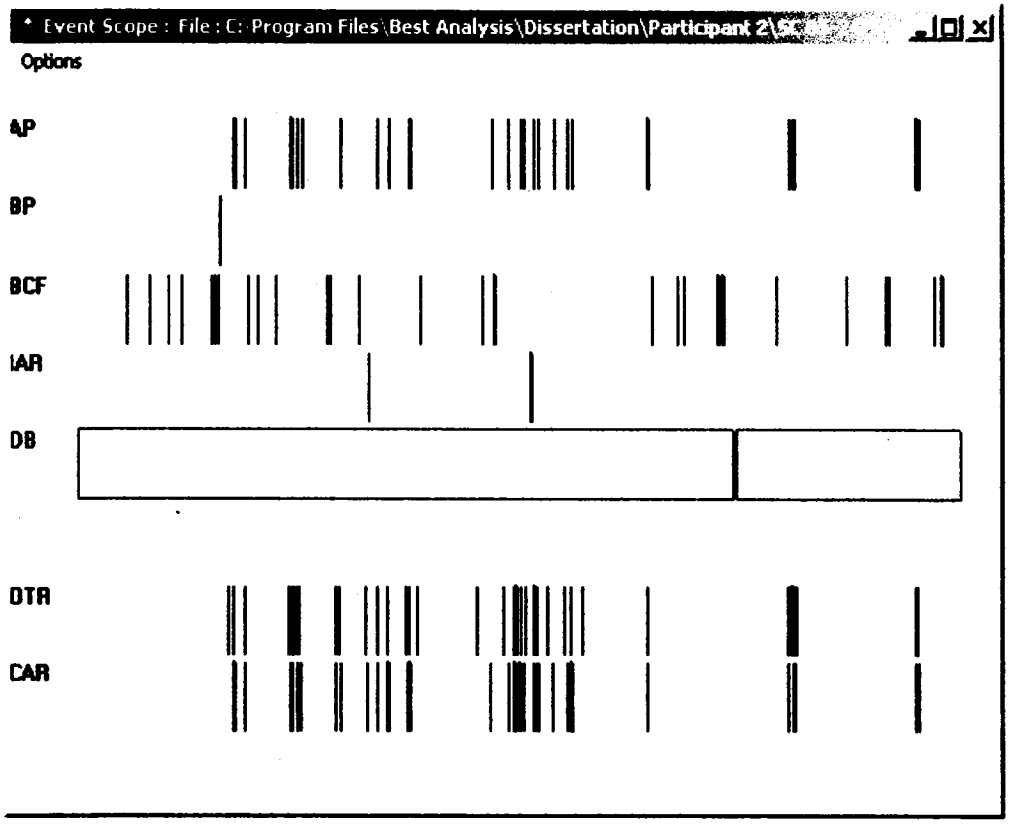
BEST Analysis© were used to conduct a range of statistical analyses. The primary analyses used in this study were Descriptive Statistics (seen above), Time Plots (Appendix B), and Reliability analyses.



Before calculating the Reliability statistics, the user was required to set parameters. Event Tolerance for Point by Point was set to 5 s (i.e., same events occurring within 5 s were scored as an agreement). The Event Duration Shift was also set to 5 s. Thus, overlapping events during the same time period were scored as agreements.



The Point by Point Reliability statistic was used for Interobserver Agreement data. The table above shows, in the columns from left to right, the assigned number of the keyboard configuration key, the abbreviation of the behavior code, the number of times observers agreed on occurrences, the number of disagreements, and the Point by Point ratio.



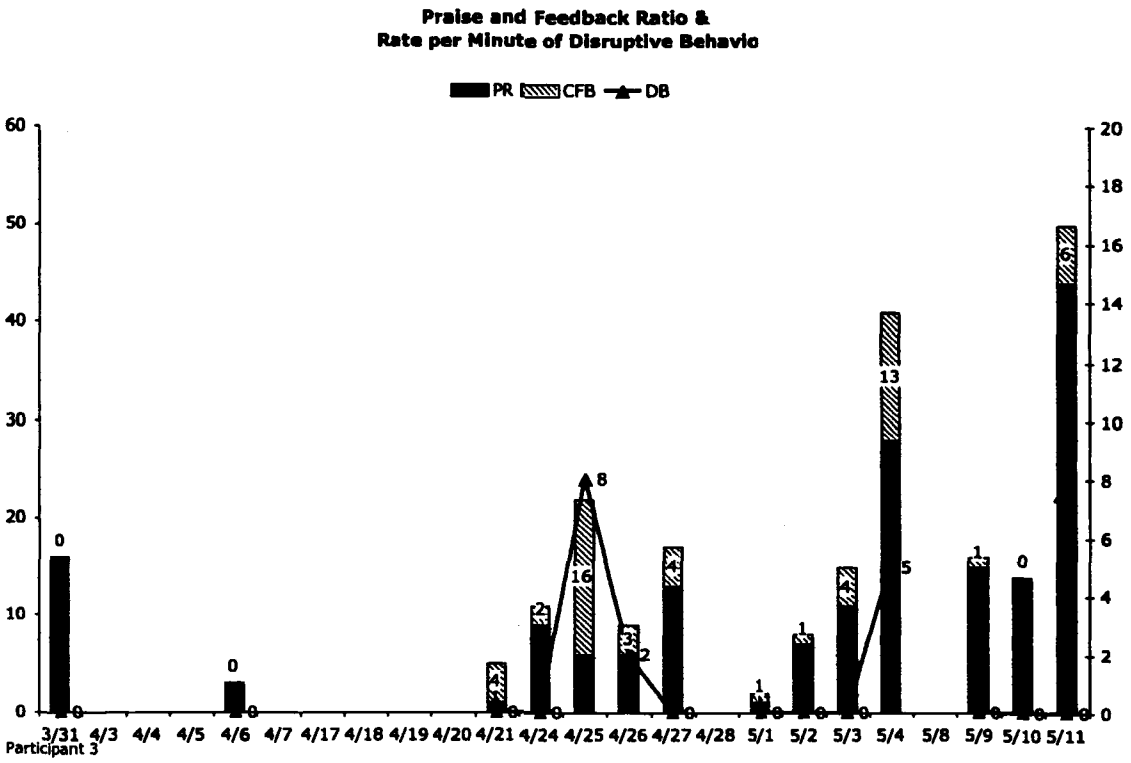
Legend
AP – Academic Praise
BP – Behavior Praise
BCF – Behavior Corrective Feedback
IAR – Incorrect Academic Response
DB – Disruptive Behavior
ACF – Academic Corrective Feedback
OTR – Opportunity to Respond
CAR – Correct Academic Response

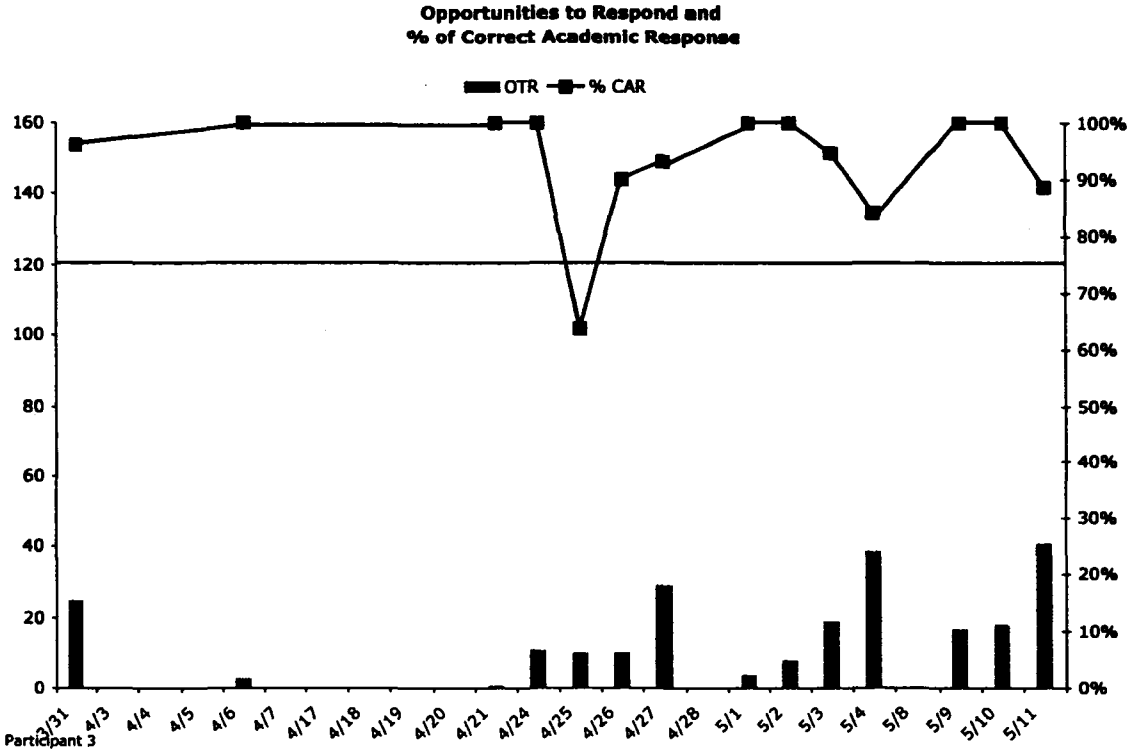
APPENDIX B

SAMPLE TIME PLOT

APPENDIX C

SAMPLE PERFORMANCE FEEDBACK GRAPHS





APPENDIX D

GOAL SETTING FORM

Classroom PBS Teacher Goal Setting Form
Research Version

Date: _____ Participant: _____

Please answer each question based on the latest performance feedback provided with this form. After you have completed this form, you will discuss your goals with the investigator.

OTRs (Opportunities to Respond) Did I achieve a total of 120 - 150 OTRs over a 15 minute session?	YES	NO
Did I meet the goal I set for myself?	YES	NO
Goal:		
CARs (Correct academic responses) Did I establish/maintain a rate of 85% or better?	YES	NO
Did I meet the goal I set for myself?	YES	NO
Goal:		
Teacher Praise Did I establish/maintain a ratio of 4:1 (praise: correction)?	YES	NO
Did I meet the goal I set for myself?	YES	NO
Goal:		
Corrective Feedback Did I provide immediate corrective feedback when student errors occurred?	YES	NO
Did I meet the goal I set for myself?	YES	NO
Goal:		

APPENDIX E

PERMISSION TO USE COPYRIGHTED MATERIALS

Permission to Use Copyrighted Material

University of Nevada, Las Vegas

I, Emma J. Martin

Holder of copyrighted material Decision-Making Worksheet, 2005

Authored by Emma Martin, Ph.D., Teri Lewis-Palmer, Ph.D., and Tary Tobin, Ph.D.

and originally published in University of Oregon

hereby give permission for the author to use the above described material in total or in part for inclusion in a doctoral dissertation at the University of Nevada, Las Vegas.

I also agree that the author may execute the standard contract with University Microfilms, Inc. for microform reproduction of the completed dissertation including the materials to which I hold copyright.

Emma J. Martin 5-27-06

Signature Date

Emma Martin Assistant Professor, Adjunct

Name (Typed) Title

(same)

Representing

APPENDIX F

INFORMED CONSENT FORMS

SEP 26 2005

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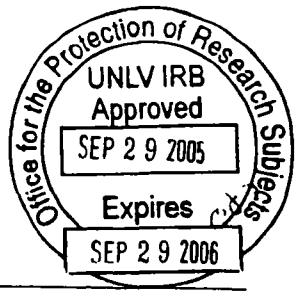

TEACHER INFORMED CONSENT

Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

Purpose of the Study

You are invited to participate in a research study. The purpose of this study is to examine the relationship between teacher behaviors and student behaviors in the classroom. The research questions to be addressed are: What are the effects of performance feedback and goal setting on the effective instructional behaviors (opportunities for academic responses, academic praise, and corrective feedback) and management behaviors (behavioral praise and corrective feedback) of classroom teachers? What is the relationship between these teacher behaviors and student academic responses and disruptive behavior?

Participants

You are being asked to participate in the study because you are a classroom teacher. Your administrator nominated you as a potential participant for this study because you were one of the teachers who matched the following criteria: high number of students with challenging behaviors in the classroom, high rates of office discipline referrals, previous teacher request for assistance with management of students in the class, and/or administrator recommendation.

Procedures

If you volunteer to participate in this study, you will be asked to do the following: Prior to the study beginning you will meet with the investigator who will review the procedures and set up the observation and meeting schedule. Observations will last approximately 20 minutes. There will be 5 observation sessions per week. During the first part of the study, the investigator will come to your classroom at the agreed upon time to observe you teaching a direct instruction lesson. The investigator will sit quietly at the back of the classroom and use a laptop computer to record specific teacher and student behaviors. The teacher behaviors of interest are the number of opportunities for students to respond academically, praise, corrective feedback, behavior correction, and behavior reinforcement. The student behaviors of interest are correct and incorrect academic responses, and disruptive behaviors. The investigator will not disrupt the lesson or interact with you or the students during the lesson.

During the second part of the study, the investigator will continue to conduct observation sessions. After each observation session, he or she will analyze the data and create graphs of the teacher and student behaviors as well as a time plot showing how all the behaviors occurred in sequence during the observation session. The investigator will provide you with these graphs within 24 hours of the

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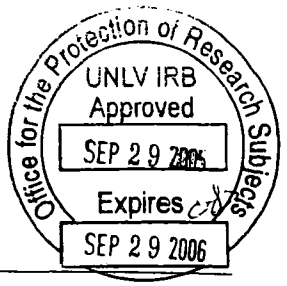

TEACHER INFORMED CONSENT

Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

observation. Once a week you and the investigator will meet for 20-30 minutes to discuss the data and the investigator will provide addition verbal feedback and answer questions. During this meeting you will complete a goal setting form for the target behaviors. You will compare your data to previous days and discuss the changes and trends you observe.

The study will last for 20-25 observation sessions. At the end of the study you will be asked to complete a social validation survey on your opinion of the effectiveness, efficiency, and value of the study procedures and goals.

Benefits of Participation
There may not be direct benefits to you as a participant in this study. However, we hope to learn whether performance feedback and goal setting are useful strategies for increasing effective teacher behavior, the relationship between these teacher behaviors and student behaviors, and whether or not teachers find these activities to be meaningful and effective. You may find the observations, feedback and goal setting to be useful professional development activities.

Risks of Participation
There are risks involved in all research studies. This study includes only minimal risks. These risks include the unintentional breach of participant confidentiality and the time spent in feedback meetings will be lost to other activities.

Cost /Compensation
There will not be any financial cost to you to participate in this study. The study will take 20-30 minutes per session for 20-25 sessions of your time. You will not be compensated for your time. *The University of Nevada, Las Vegas may not provide compensation or free medical care for an unanticipated injury sustained as a result of participating in this research study.*

Contact Information
If you have any questions or concerns about the study, you may contact Dr. Matt Tincani at **895-2695** or Shannon Crozier at **895-3205.** For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office for the Protection of Research Subjects at 702-895-2794.**

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TEACHER INFORMED CONSENT
UNIVERSITY OF NEVADA LAS VEGAS
Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Confidentiality
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for at least 3 years after completion of the study. After the storage time the information gathered will be destroyed and computer files will be erased.

Participant Consent:
I have read the above information and agree to participate in this study. I am at least 18 years of age. A copy of this form has been given to me.

_____ _____
Signature of Participant Date

_____
Participant Name (Please Print)

Participant Note: Please do not sign this document if the Approval Stamp is missing or is expired.

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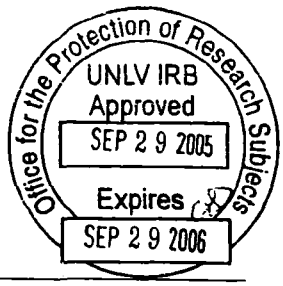

PARENT INFORMED CONSENT

Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

Purpose of the Study
Your son/daughter is invited to participate in a research study that investigates the effectiveness of teaching procedures that one of your child's teachers is using. If you agree, the observational data we collect will be documented and described anonymously (e.g. Teacher A) to others for the purposes of showing effective instructional practices to other teachers. Additionally, student data in the anonymous form of whole-class descriptions (e.g., the number of correct academic responses, the number of disruptive behaviors) will be collected to further describe the effectiveness of the teacher's instructional activities.

Participants
Your son/daughter is being asked to participate in the study because he/she is a student in (class room teacher's name) class.

Procedures
If you volunteer for your son/daughter to participate in this study, the procedures will be as follows. An investigator will observe your son's/daughter's class three to five times per week. The duration of the study will be approximately 8 weeks. During the study, students will participate in their regular classroom activities.

Benefits of Participation
There may be no direct benefits for your son/daughter as a participant in this study. However, we hope to learn more in the areas of: (a) documenting effective teaching practices, (b) providing case material with which to educate future teachers, and (c) providing information to other teachers about the relationship between teacher behaviors and student behaviors.

Risks of Participation
There are risks involved in all research studies. This study, however, includes only minimal risks due to the purely descriptive nature of data collection on an ongoing set of instructional practices in your child's classroom setting.

Cost /Compensation
There will not be any financial cost for your son or daughter to participate in this study. You will not be compensated for your time. *The University of Nevada, Las Vegas may not provide compensation or*

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PARENT INFORMED CONSENT

Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

free medical care for an unanticipated injury sustained as a result of participating in this research study.

Contact Information
If you have any questions or concerns about the study, you may contact Dr. Matt Tincani at **895-2695** or Shannon Crozier at **895-3205.** For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office for the Protection of Research Subjects at 702-895-2794.**

Voluntary Participation
Your son's/daughter's participation in this study is voluntary. They may refuse to participate in this study or in any part of this study. They may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Confidentiality
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you or your child to this study. All records will be stored in a locked facility at UNLV for at least 3 years after completion of the study. After the storage time the information gathered will be destroyed and computer files will be erased.

Participant Consent:
I have read the above information and agree for my son/daughter to participate in this study. I am at least 18 years of age. A copy of this form has been given to me.

Signature of Parent _____ Date _____

Participant Name (Please Print) _____

Participant Note: Please do not sign this document if the Approval Stamp is missing or is expired.

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STUDENT INFORMED ASSENT

Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

Purpose of the Study
As a student in your classroom, you are invited to participate in a study that describes the things that your teacher does, and how you are learning in your class. In addition, we will describe some of the things that you do in class when working with your teacher. All of this information will be used to try to help your teacher become more effective. All of the information that we collect is to describe your teacher and the types of things that you do when your teacher asks you to. All information will be kept in complete confidence and not shown to anyone other then those of us who are describing your teacher's activities.

Participants
You are being asked to participate in the study because you are a student in (teacher's name) class.

Procedures
If you volunteer to participate in this study, you will be asked to do the following: The study will consist of an investigator observing your class three to five times per week. The duration of the study will be approximately 8 weeks. You will participate in regular classroom activities.

Benefits of Participation
There may be no direct benefits for you as a participant in this study. However, we hope to learn more about good teaching.

Risks of Participation
There are risks involved in all research studies. This study, however, includes only minimal risks due to observing you in your regular classroom environment.

Cost /Compensation
There will not be any financial cost to you to participate in this study. You will not be compensated for your time. *The University of Nevada, Las Vegas may not provide compensation or free medical care for an unanticipated injury sustained as a result of participating in this research study.*

Contact Information
If you have any questions or concerns about the study, you may contact Dr. Matt Tincani at **895-2695** or Shannon Crozier at **895-3205.** For questions regarding the rights of research subjects, any

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STUDENT INFORMED ASSENT

Department of Special Education

TITLE OF STUDY: Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors

INVESTIGATOR(S): Matt Tincani and Shannon Crozier

CONTACT PHONE NUMBER: 895-3205

complaints or comments regarding the manner in which the study is being conducted you may contact **the UNLV Office for the Protection of Research Subjects at 702-895-2794.**

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with the university. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Confidentiality
All information gathered in this study will be kept completely confidential. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for at least 3 years after completion of the study. After the storage time the information gathered will be destroyed and computer files will be erased.

Participant Consent:
I have read the above information and agree to participate in this study. A copy of this form has been given to me.

Signature of Participant _____ Date _____

Participant Name (Please Print) _____

Participant Note: Please do not sign this document if the Approval Stamp is missing or is expired.

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Social/Behavioral IRB – Full Board Review
Approval Notice

NOTICE TO ALL RESEARCHERS:
Please be aware that a protocol violation (e.g., failure to submit a modification for any change) of an IRB approved protocol may result in mandatory remedial education, additional audits, re-consenting subjects, researcher probation suspension of any research protocol at issue, suspension of additional existing research protocols, invalidation of all research conducted under the research protocol at issue, and further appropriate consequences as determined by the IRB and the Institutional Official.

DATE: October 7, 2005

TO: **Dr. Matt Tincani**, Special Education

FROM: Office for the Protection of Research Subjects

RE: Notification of IRB Action
Protocol Title: **Classroom PBS: The Effects of Performance Feedback and Goal Setting on Effective Teaching Behaviors**
Protocol #: 0509-1694

This memorandum is notification that the project referenced above has been reviewed by the UNLV Social/Behavioral Institutional Review Board (IRB) as indicated in Federal regulatory statutes 45CFR46. The protocol has been reviewed and approved.

The protocol is approved for a period of one year from the date of IRB approval. The expiration date of this protocol is September 29, 2006. Work on the project may begin as soon as you receive written notification from the Office for the Protection of Research Subjects (OPRS).

PLEASE NOTE:
Attached to this approval notice is the **official Informed Consent/Assent (IC/IA) Form** for this study. The IC/IA contains an official approval stamp. Only copies of this official IC/IA form may be used when obtaining consent. Please keep the original for your records.

Should there be *any* change to the protocol, it will be necessary to submit a **Modification Form** through OPRS. No changes may be made to the existing protocol until modifications have been approved by the IRB.

Should the use of human subjects described in this protocol continue beyond September 29, 2006, it would be necessary to submit a **Continuing Review Request Form** *60 days* before the expiration date.

If you have questions or require any assistance, please contact the Office for the Protection of Research Subjects at OPRSHumanSubjects@ccmail.nevada.edu or call 895-2794.

APPENDIX G

SOCIAL VALIDITY SURVEY

Performance Feedback and Goal Setting
Social Validity Survey

Please answer the following questions using the scale on the right:	1 = Strongly disagree 2 = Disagree 3 = Slightly disagree 4 = Slightly agree 5 = Agree 6 = Strongly agree

1.	I was aware of these teaching behaviors before participating in this study.	1	2	3	4	5	6
2.	I thought the feedback and goal setting sessions were too long.	1	2	3	4	5	6
3.	I found the goal setting process to be beneficial.	1	2	3	4	5	6
4.	I found the feedback sessions to be beneficial.	1	2	3	4	5	6
5.	I found the performance graphs to be beneficial.	1	2	3	4	5	6
6.	I have the skills needed to use these teaching behaviors effectively.	1	2	3	4	5	6
7.	The amount of time and energy to include these teaching behaviors in a lesson is reasonable.	1	2	3	4	5	6
8.	I think these teaching behaviors improved the learning of my students.	1	2	3	4	5	6
9.	I think these teaching behaviors improved the behavior of my students.	1	2	3	4	5	6
10.	Now I will be better able to handle students with challenging behaviors in my classroom.	1	2	3	4	5	6
11.	I would recommend training in these teaching behaviors for other teachers.	1	2	3	4	5	6
12.	I think training in these teaching behaviors should be included in teacher education programs.	1	2	3	4	5	6
13.	The researcher was effective in providing feedback and answering questions (e.g., used language that was easy to understand).	1	2	3	4	5	6

Performance Feedback and Goal Setting
Social Validity Survey

14. What do you think were the goals of this study?
15. To what extent do you think the study achieved its goals?
16. Do you think training teachers to use these effective teaching behaviors will help them be successful including students with challenging behaviors?
17. How effective do you think the procedures (feedback and goal setting) are for development of teaching skills?

APPENDIX H

TREATMENT INTEGRITY CHECKLIST

Performance Feedback and Goal Setting
Treatment Integrity Checklist

Date: _____ Observer: _____

Participant: _____

Components	
Performance Feedback	Completed? Y or N
1. Graphs printed by end of block	
2. Graphs delivered personally to teacher	
3. Teacher presented with opportunity to ask questions	
Percent completed:	# of Y/3 =
Goal Setting	
1. Researcher gives verbal feedback on graphs from week	
2. Teacher behavior is discussed	
3. Teacher is presented with opportunity to ask questions	
4. Previous goals are reviewed (except first session)	
5. Goal setting form completed for following week	
Percent completed:	# of Y/5 =

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UNLV Graduate Research Training Assistantship, 2005
UNLV Graduate and Professional Student Association Grant, 2005
UNLV Graduate and Professional Student Association Grant, 2004
The National Dean's List 2004
Who's Who Among Students in American Universities and Colleges, 2003
Boston University School of Education Field Associate Scholarship 2002

Publications:

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