INCREASING INSTRUCTIONAL TIME THROUGH PERFORMANCE FEEDBACK IN CONSULTATION

A Dissertation Presented

by

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DEDICATION

I would like to dedicate my dissertation to my parents for always encouraging me, and to my husband for enthusiastically supporting this entire process

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ABSTRACT

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Instructional time is a precious commodity within the school day. Research has shown (Gettinger & Ball, 2008; Hollywood, Salisbury, Rainforth & Palombaro, 1994) that students are only academically engaged for a fraction of time that is protected for instruction. In order to increase academic achievement, we must increase and protect instructional time. This study used a multiple baseline design across teachers to examine teacher behavior and student engagement. Teachers and students were systematically observed in the classroom. In the first phase, the data from these observations were provided graphically to teachers, thus serving as performance feedback. Performance feedback has been demonstrated as an effective means of increasing treatment integrity and facilitating teacher behavior change (Noell et al., 2005). During the second phase of the study, consultation meetings included a review of the data, collaborative brainstorming of strategies for increasing instructional time and goal setting. It was hypothesized that sharing performance feedback would lead to increased levels of

observed instructional time. Results show inconsistent effects for increasing instructional time across participants.

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS v

ABSTRACT vi

LIST OF TABLES x

LIST OF FIGURES xi

CHAPTER

1. INTRODUCTION, BACKGROUND AND PURPOSE 1

    Introduction to Teaching and Time 1
    Effective Teaching 7
    Consultation in the Practice of School Psychology 12
    Performance Feedback in Consultation 15
    Observing Behavior During Allocated Instructional Time 16
    Statement of the Problem 20
    Research Questions 21

2. LITERATURE REVIEW 23

    Consultation Methodology 23
    Performance Feedback 30
        Performance feedback Used to Improve Behavior and Academic Outcomes 33
        Performance Feedback and Behavior Specific Praise 38
        Performance Feedback Used to Increase Academic Engagement 41
        Performance Feedback Used to Train Teachers 44
        Feedback Delivery 45
        Feedback and Teaching 47
    Observation of Teachers and Students 48
        Observing Teachers 50
        Observing Teachers and Students 50
        Observing Students 51

3. METHOD 54

    Participants and setting 54
    Dependent Variables 56
        Time on Teaching (TOT) 56

Behavior Observation of Students in Schools (BOSS; Shapiro, 1996) 58

Procedures 59
Observation sessions 59
Inter-observer Agreement 60
Consultation 61
Experimental Design 62
Phases 62
Treatment integrity 63
Treatment acceptability 63
Data Analyses 63

4. RESULTS 67

Research Questions 67
Inter-Observer Agreement 67
Changes in Teaching Behavior 78
Instructional time in relation to student behavior 97
Social validity of the Time on Teaching (TOT) 100

5. DISCUSSION 103

Changing teacher behavior 103
The effect of teacher behavior on student behavior 108
The social validity of the TOT 111
Limitations 111
Future Research 115

APPENDICES

A. CONSULTATION PROCEDURES 118
B. TEACHER SURVEY 119
C. RECRUITMENT LETTER 120

REFERENCES 122

LIST OF TABLES

Table Page

1. IRD Effect Sizes and Confidence Intervals……..69

LIST OF FIGURES

Figure Page

1. Percent of Intervals Observed Teaching……..……..……...…70

2. Percent of Intervals Observed of Feedback……..…….……..…..…71

3. Percent of Intervals Observed of Environment Management…….…...…..…..72

4. Percent of Intervals Observed in Behavior Management…...…….…..……73

5. Percent of Intervals Observed of On-Task Teacher Behavior……..…….74

6. Percent of Intervals Observed of Off-Task Teacher Behavior…….…….75

7. Percent of Intervals Observed of On-Task Student Behavior……76

8. Percent of Intervals Observed in Off-Task Student Behavior…...……77

CHAPTER 1:

INTRODUCTION, BACKGROUND AND PURPOSE

Introduction to Teaching and Time

The hours in a school day are carefully measured and defined yet there never seems to be enough time. The school year has a set number of days, which is frequently around 180, as per state law (Caldwell, Huitt, & Graeber, 1982). Each school day lasts approximately six to seven hours. These numbers vary since it is up to each state to define their school calendars (Silva, 2007). The school day is segmented and divided based on the schedule of each school building. Some students have lunch while others have recess. Some students have art class while others have music class. Students move around the school building to attend various activities and special classes. Each school day includes time allocated for instruction, lunch, recess, art, physical education and transitions. A common complaint among educators is that there is not enough time to teach everything in their curricula, plan as well as they would like, or help every student. Many advocate for more teaching time through programs such as extending the school day and eliminating the parts of the school day that are not essential to passing state-wide exams - such as art and music (Howell & Nolet, 2000). Others have suggested eliminating recess, shortening lunch or adding extra school days. However, adding extra time to the school day will not likely result in better student outcomes if the instruction delivered in that time is ineffective. Moreover, perfect attendance in an ineffective school does not increase student learning (Howell & Nolet, 2000). Instead of focusing on adding time to the school day, researchers could focus on understanding how we use the time we

have and develop new strategies for being more efficient and effective with the limited hours available.

The hours in a school day are often divided into four categories in the research (Silva, 2007). The total number of hours spent inside the school building is often labeled "*allocated school time.*" This includes transitions between activities and rooms in the building, recess, lunch and other time in the school day that is defined as "*allocated class time." "Allocated class time*" is the time within the school day that is structured in classrooms such as snack, transitions, lining up or morning meeting. School time and class time includes activities that are not strictly related to academic skills – such as art class, music class or school-wide assemblies. Each day there is time set aside for instruction called *"allocated instructional time"*. This time is protected for instruction, but it is still susceptible to many interruptions. Within the instructional time block, there is a percentage of time that is engaged student time, time-on-task, transition time and waiting time (Berliner, 1990; Howell & Nolet, 2000; Silva, 2007). Engaged academic time is defined as time when the student is actively working on academic tasks. Transition time is defined as the time between activities. It can be physical transitions such as moving from the rug to desks or content transitions such as moving from math to reading. During *"allocated instructional time,"* teachers might end up dealing with behavior or environmental management as well. There are methods to make these tasks streamlined and less time consuming, but these skills are often not addressed in teacher education programs (Carnine, 1992).

Within the block of time set aside as allocated instructional time is the fourth category and the most valuable type of time in schools - *academic learning time* (ALT).

ALT is defined as the time that each student is engaged in activities that are related to the desired educational outcome (Berliner, 1990; Silva, 2007). Rangel and the American Educational Research Association (2007) suggest increasing the amount of time that is allocated for instruction since that will allow students a greater chance at being engaged in ALT. The authors suggest that with a small increase in allocated instructional time, and a change in instructional methods, students could achieve a higher rate of learning time. One goal of effective teaching practices should be to prioritize increasing ALT and student engagement time since that is where student learning is happening. This division of time in the school day has been addressed in the educational literature for twenty years (Berliner, 1990; Borg, 1980; Gettinger & Ball, 2008; Silva, 2007), yet few studies have attempted to increase academic learning time in a given classroom (Berliner, 1990; Gettinger & Ball, 2008).

In addition to all of the activities that compete with allocated instructional time for scarce hours in the school day, teachers have many responsibilities within the classroom that compete with teachers' time to devote to instruction. Teachers are expected to manage student behavior, control their classroom environments, coordinate their schedules, and deal with a variety of meetings, logistics and paperwork. The demands placed upon teachers' time and their classroom schedules have only increased in recent years with the passing of No Child Left Behind (Zellmer, Frontier, & Pheifer, 2006). For example, the time spent testing, preparing for testing, and organizing the materials and people to coordinate testing have resulted in a loss of instructional time. One study found that when special education teachers are involved in test administration, it results in three weeks of disrupted specialized services for students with learning needs

(Zellmer et al., 2006). The loss of this much instructional time has serious implications for the achievement of these struggling students.

The amount of curricular content that teachers are expected to cover within a given school day increases every year. For example, schools are adding new curricula to address bullying, social emotional growth, behavior and Internet use. Some schools approach these topics by integrating them throughout the day rather than using a stand-alone curriculum. These curricula may be important to teach in schools, but they compete with the instructional time that can be devoted to other academic areas, such as literacy, mathematics, science and social studies and further complicate scheduling academic learning time. One solution for increasing time is adding extra hours to the school day or increasing the days in each school year. Many believe the current school year, with its long summer vacation, is based on an antiquated farming schedule (Cuban, 2008). While it is true that when formal schooling began in the 1900's the majority of American children did live on farms and only attended school for 5 to 6 months a year, their urban counterparts attended school for 11 or even 12 months a year (Cooper, Valentine, Charlton, & Melson, 2003). The nine-month school year with the long summer vacation is actually a product of the early 20th century when urban middle class families asked for children to be released from schools to their families (Cuban, 2008). The traditional summer vacation also developed out of necessity when schools found they couldn't teach children in hot classrooms during the summer months, but today many schools have climate control technology (Silva, 2007).

Year-round schooling has been gaining support since the 1960's. This configuration of the school calendar has a misleading name since it includes the same 180

days but distributes them more equally throughout the entire calendar year. Students might have a 2-3 week vacation every few months instead of the long summer break (Cuban, 2008). Criticism of this type of schedule and calendars that include more than 180 school days comes from policy makers as well as teachers. Policy makers warn of increasing costs both in pay and energy costs required to keep school buildings open more days and during more seasons. Teachers express concern about burnout from their jobs (although teacher burn-out is a common complaint even with the current schedule). Parents have also voiced concern when summer break is challenged because they report enjoying the time off with their children and having time for vacation or camp activities (Cooper et al., 2003). Cooper et al. (2003) conducted a meta-analysis on research of academic achievement scores before and after summer vacation. They found that summer vacation is responsible for the loss of approximately one month of academic instruction, meaning that every fall, students start out a month behind where they ended in the spring. More research needs to be done to ascertain whether the year round schooling schedule alleviates this summer academic loss (Cooper et al., 2003).

Extending the school year either by adding days or re-distributing those days throughout the calendar year is costly. Year-round schooling, as described above, typically does not add days of school and is the less costly method, provided that the school is equipped to handle the energy demands of hot summer days. Adding more days onto the school calendar can cost a great deal because of the extra pay required for teachers, staff, bussing, and maintenance. For example, in Minnesota, school officials proposed to extend their school days from 175 to 200, but they were rejected upon

discovery that such an increase would cost close to $750 million dollars (Cuban, 2008; Silva, 2007).

A more cost-effective method for adding school time is maintaining the current calendar, but lengthening the school day. Lengthening the school day by thirty minutes or an hour or adding school hours on Saturdays has become an increasingly popular method for adding extra hours to the school year, and these extra hours may make a difference. Silva (2007) reported international statistics from a recent study showing how the United States compares in math with other countries and the corresponding number of hours of academic instruction in all academic subjects a student receives throughout the year. The United States typically has 799 hours of academic instruction in a year and ranked 24 out of 29 on an internationally given math test. In contrast, Korea ranked number two and has 1079 hours of academic instruction in a school year (Silva, 2007).

Adding extra hours to the school day may be a more cost effective option than extending the school year because it does not lead to extra costs for buses or as much money to be spent on paying staff for extra hours (Silva, 2007). These innovations are also popular with working parents, who benefit from the extra hours of childcare more school hours provide. However, they do not necessarily translate to measureable gains in instruction. Glass (2002) conducted a simulated study by using prior research and adding an hour of instructional time to every school, with thirty minutes devoted to math and thirty minutes devoted to reading instruction. He found that at the end of a year, students were less than a month ahead of where they would have been without the extra hours. He suggests instead that administrators try more cost-effective strategies for improving student achievement such as buying new equipment, hiring remedial specialists, or

raising teacher salaries (Glass, 2002). Although there are ways to use the limited time in a school day more effectively before resorting to adding on extra hours or days to the school year, "advocates find it easier to demand more time than to dirty their hands squeezing fat out of the school day" (Hess & American Enterprise Institute for Public Policy, 2009). Adding minutes to the school day opens up debates about teacher pay and funding, so instead we should focus our efforts on creating meaningful change in how teachers structure the environments in their classrooms for learning (Howell & Nolet, 2000).

Effective Teaching

Effective teachers value their instructional time and use every minute strategically. Rosenshine and Furst (1973) did an extensive literature review to investigate characteristics of teachers who get significant results in their student outcomes. They found that effective teachers share clarity of instruction, enthusiasm, task-oriented, teacher-directed instruction and opportunities for student questioning. Other factors that have been found to mark effective teaching are teachers that ensure short transition times, provide timely student feedback and deliver instructional content in targeted small groups (Taylor, Pearson, Clark, & Walpole, 2000). Kameenui and Carnine (1998) suggest that hands-on learning activities that gain more student engagement are another characteristic of effective teaching. Effective teachers use a variety of strategies to draw students into learning, but they also manage their instructional time well and consider that time valuable.

Teachers have many choices for how to organize their classrooms, structure their lessons and group their students. These choices affect student outcomes and student

behavior. Teachers can choose to teach the entire class, or split students into smaller groups for instruction. More research needs to be done to determine whether small group or whole group instruction is more effective. Whole group instruction is one of the most common forms of instruction used in elementary school classrooms, as shown by a variety of studies (Vaughn, Hughes, Moody, & Elbaum, 2001). Teachers choose this method because it allows for a streamlined delivery of content and what they anticipate to be a less challenging classroom to manage both behaviorally and environmentally. However, whole class instruction leaves little time for individualizing or differentiating instruction for students with various academic or behavioral needs (Vaughn et al., 2001). Lou et al. (1996) performed a comprehensive meta-analysis on small group instruction. Unlike other meta-analyses on this topic, Lou et al. (1996) did not focus on students with learning disabilities, which led to a greater number of possible studies. Results showed that small group instruction improved achievement for the average student, $d = .17$, suggesting a small positive effect. This translates to performance of an average student at the 50^{th} percentile with whole class instruction increasing their achievement to the 57^{th} percentile with small group instruction. Larger effects of small groups as compared to whole class instruction, $d = .42$, were seen when looking just at the studies that used teacher-made tests as outcome measures as opposed to standardized achievement tests or researcher-made tests. These measures were more closely linked to instruction and therefore more sensitive to changes in instruction (Lou et al., 1996). These findings suggest that small group instruction can improve student achievement, but that does not mean every teacher will feel comfortable instituting this practice in their classroom. Also,

this type of instructional format may only be one of several components necessary for effective teaching.

When teachers change the structure of their classrooms or their teaching, they can create meaningful changes in the number of minutes afforded for instruction. In a descriptive study on instructional time, Wang (1985) observed 28 classrooms for a total of 197 hours. Observers coded teacher behavior at the end of each minute, yielding 11,806 moments of observation. The classrooms were piloting the Adaptive Learning Environments Model, which is designed to "make optimal use of school resources, including student and teacher time" (Wang, 1985). Teachers spent 81% of their time focused on instruction and 18.9% on non-instruction. This was divided further in their coding scheme. 93% of the instructional time was teaching, while teachers spent 2.8% percent on evaluating and 3.8% on planning. The non-instructional time was divided between behavior management (44%), conversations with students (16.8%) and the remainder (39.1%) was comprised of "other activities" (Wang, 1985). During the time focused on instruction, the teachers spent time doing individual, small group and whole group instruction. Within each of those settings, the observers' data was examined to find how teachers broke down their time with each type of instructional format. Small group instruction only took up 5.17% percent of total instructional time, but teachers spent the majority of that time teaching (78.1%) and only 3.2% of their time managing behavior. In contrast, teachers spent 18.2% of their instructional time in whole group instruction. During this time, 61% was spent on teaching, while 18.8% of the observed intervals were used for behavior management. While this study provided a great deal of information about the teaching behaviors of these teachers, it did not show how this influenced

student outcomes. Additionally, no effort was made to use these data in order to change teaching behavior. Also, this study did not include enough information on the coding scheme used in order to replicate their findings. The teachers in this study spent the majority of their time focused on instruction, but nearly 20% of their time was still coded as non-instructional (Wang, 1985).

Within allocated instructional time, there are environmental demands that must be satisfied in order to manage a classroom such as passing out papers, moving seats and transitioning. A growing area of research in consultation and positive behavior support is around transition times. Transition time is defined as the time between activities or the shift between instructional content. There are movement transitions and content transitions. Transitions are a necessary part of the allocated classroom time, but often lead to behavior management issues, off-task behavior and a loss of precious instructional time. Paine, Radicci, Roselli, Deutchman, and Darch (1983) estimated that transitions between activities in elementary school classrooms typically take five to ten minutes. On average, a class transitions ten times throughout a school day, which means approximately 20% of their time is spent transitioning. Paine et al. (1983) suggest teaching transition procedures and timing students on them until they are efficient and effective. This method resulted in one teacher gaining an hour of instructional time each day because her transitions became thirty seconds long (Paine et al., 1983). Squires and Joyner (1996) describe one school that shortened their dismissal process by five minutes. Over the course of the entire year, reassigning these five minutes of classroom time to instructional time helped the school gain 2.5 days of instructional time.

Lee (2006) attempted to change transition time in a different manner. He found that high-probability requests are an effective method for increasing behavior momentum that has been used previously in the classrooms. High-probability requests are ones that students are likely to do without resistance, such as clapping their hands or writing down their name. Then the teacher follows up with a low-probability request such as the direction to begin an assignment. Lee (2006) found this method to be effective both for transitions to academic work and within academic tasks.

In another study designed to reduce transition time, Codding and Smyth (2008) used performance feedback to decrease time spent on transitions as observed through direct observation. This study took place in a high school with three biology teachers. Instruction was videotaped for 39-minute classroom periods. Observers coded the observations for student on-task behavior and whether the teacher was engaged in instruction or transition. Using a multiple baseline design across teachers, Codding and Smyth (2008) recorded teacher and student behavior at baseline. Teachers then received performance feedback on their transition time. In the next phase, teachers visually inspected performance feedback on their transition time and a checklist of strategies to improve transitions and behavior management. Performance feedback and observation were faded in the following phase and follow up data were also collected. This study was effective at shortening transition times and increasing instructional time. This research showed that shortening transitions can lead to a greater amount of time spent on instruction (Codding & Smyth, 2008). Additionally, this research showed that the use of consultation with performance feedback can effectively support teachers in improving their classroom practices.

Consultation in the Practice of School Psychology

School psychologists often work through teachers to create change in the classroom, such as increasing instructional time. Rather than being the interventionist themselves, school psychologists are frequently engaged in consultation, which is an indirect method of service delivery. By working with one teacher around a specific issue, the school psychologist can facilitate new learning for the teacher that may affect many children. Consultation is a cost-effective way to use the school psychologist. For example, a school psychologist consulting with a teacher around class-wide behavior has the opportunity to affect the educational experience of all current and future students that are taught by that teacher. Of course, this assumes that the teacher will apply what she learns from this consultation experience to her later professional activities (Erchul & Martens, 1997; Noell & Witt, 1996). The hope is that by changing one teacher's behavior, the school psychologist can effect more change in the classroom than by working with each individual child. Good and Brophy (1974) found that teachers adjust their behavior when working with non-target students as a result of consultation to address the needs of a target students, but this finding needs to be replicated.

Considering the growing shortage of school psychologists, the need for services that disperse the efforts of school psychologists is becoming more important (Dawson et al., 2004). Curtis, Grier, and Hunley (2004) reported staggering rates of expected school psychologist retirement in the next 10-15 years, which will leave thousands of jobs unfilled and increase the student to school psychologist ratio beyond acceptable limits. For these reasons, consultative services have become an important area for research and

practice in contemporary school psychology. Yet, there remains a need for more research on effective methods of consultation, follow up and treatment integrity.

Consultation addresses a broad range of services such as academic or behavioral concerns. Consultative services can target a specific child, focus on a class-wide issue, or function on the systems level to create change on a larger scale. For some issues, the consultation experience alone is enough to solve the problem. Teacher consultation can change a variety of factors in the classroom. The consultation might address an individual child's behavior or academic difficulties. Consultation could be geared towards instituting a new intervention around behavior or academics to benefit the entire class. Sometimes consultation is on-the-job professional development for the teacher to support curricular or behavioral issues (Rosenfield, 2008). A teacher might begin consultation assuming they would be getting help with a student, when in fact they end up getting help with their teaching or behavior management. Through consultation, the school psychologist is able to tailor an intervention to the teacher and offer relevant materials, advice or knowledge.

Consultation requires a great deal of time and effort. This means that money and resources are allocated to consultation efforts that would otherwise be spent on other services. More research needs to be done on whether consultation is really the best use of the school psychologist's limited time (Noell & Witt, 1996). Too often, school psychologists and administrators assume that just having a teacher speak with a school psychologist is enough to create change, but this assumption is unfortunately not supported in research. Talking to teachers is not enough to change their behavior. Blom-Hoffman and Rose (2007) advocate the use of motivational interviewing strategies in

consultation in order to assess a teachers' readiness for change. MI has not been used much in the schools, but there is an extensive research base for it in medicine and addiction prevention (Miller & Rollnick, 2002). Through MI, the consultant uses questions to determine the teachers' readiness to change and then helps alleviate any ambivalence about change through collaborative planning of problem solving strategies (Blom-Hoffman & Rose, 2007; Miller & Rollnick, 2002).

In addition to assessing readiness to change, consultants can follow up after consultation. One of the biggest problems facing consultation since its inception in the schools has been treatment integrity. Research has shown that teachers, like most people, may say they intend to do something but might not follow through. Witt (1997) reviewed several studies on consultation and found the teacher was likely to say they would do the intervention, but in reality they would not implement it as intended unless there was an additional component such as an observer, treatment integrity checklist or performance feedback.. Treatment integrity, in this context, refers to the degree to which teachers implement an intervention or treatment accurately (Noell et al., 2000). Frequently school psychologists engage in consultation and develop an effective intervention but neglect the follow-up necessary to put it in place. There are a variety of reasons that treatment integrity is difficult to achieve. Some reasons that interventions fail are lack of time, complexity of the intervention, resources, number of treatment agents, perceived effectiveness and actual effectiveness or motivation (Gresham 1989). "Consult and hope" practices are not effective. Instead, researchers need to use strategies to monitor program implementation and treatment effectiveness. This means following up consultation with

self-monitoring, compliance check lists and performance feedback as well as gathering student outcome data (Gresham, 1989).

Performance Feedback in Consultation

Previous research has shown that performance feedback embedded within the consultation activities increases teacher behavior change and improves treatment integrity and student outcomes. Performance feedback is defined in the consultation literature as feedback that an individual receives following observation of a specific behavior or target. Noell et al. (2005) used performance feedback to enhance treatment integrity in a study on behavior plan implementation. Interestingly, he compared visual performance feedback to weekly check-ins with the teacher and a commitment emphasis condition that used social pressure to increase treatment integrity. Results showed that the condition with performance feedback had the strongest level of treatment implementation (Noell et al., 2005). Other studies have shown that performance feedback can also have positive effects in changing student behavior. Fuchs (1989) found that progress monitoring students and displaying their results graphically increased student outcomes. However, there is limited research on the effects of performance feedback on changing teacher behavior as it relates to teaching practices (Leach & Conto, 1999).

Performance feedback in schools exists on various levels that have yet to be studied and compared to each other. For example, the role of the person giving the feedback can vary, and this may affect the results. The frequency of feedback and whether it is given in public or in private might be another variable to study. There is also a need for more research on the effects of feedback in response to the teaching process as compared to feedback on student outcomes (Leach & Conto, 1999).

Previous research has shown that teacher behavior is sensitive to performance feedback (Codding & Smyth, 2008; Leach & Conto, 1999) but teachers are ultimately in charge of how they manage their allocated instructional time. Performance feedback can be a useful tool to help teachers manage their time use more effectively. Some teachers set a schedule and stick to it, while others waver depending on their students' needs. Often teachers do not receive any feedback on their teaching or how they structure their classroom. Performance feedback following direct observation might offer teachers an opportunity to evaluate and change their behavior in order to create more opportunities for academic learning time.

Observing Behavior During Allocated Instructional Time

In order to help teachers increase instructional time, the amount of time they spend on instruction needs to be known. Measuring what goes on inside the classroom has challenged researchers because of the logistics of measuring teacher and student behavior. It is also hard to judge what typically occurs in a classroom from one short observation period. The amount of time needed to accurately sample what occurs in a classroom is unknown, but it is likely more than the standard 15-30 minute observation that school psychologists routinely do for behavioral assessments. When observing in a classroom, the observer is presented with many competing distractions. Accurately selecting the target variables to observe greatly influences the results of an observation. Some of the popular classroom observation instruments on the market today use a method in which the observer monitors the target behavior while taking minimal notes for a certain period of time. At the end of that time period, the observer codes what she observed on a pre-determined list of behaviors. While these methods are well studied and

research-based (NICHD Early Child Care Research Network, 2005; Vannest, Soares, Harrision, Brown, & Parker, 2005), it can be challenging for an observer to accurately record the observation data after the observation takes place. Instead, the preferred method for this study is direct observation of teacher and student behavior where the observer observes in real time what is actually happening. Systematic direct observation allows for observers to see more than just the child's behavior. An observer will also be able to see the ecological features of the environment that influence the child's behavior such as the instruction, classroom set up, time of day, or other potentially alterable environmental conditions (Merrell, 2008).

The Time on Teaching (TOT) is a 30-minute, momentary time sampling observation tool that is hypothesized to be sensitive to changes in the instructional practices of classroom teachers. The TOT is based on the work of Gibson and Hasbrouck (2007), who developed a brief observation tool using a frequency count to categorize teacher behavior as either managing the classroom environment, delivering instruction, or correcting behavior. The original observation tool was designed for principals to use while monitoring teachers' performance, with the ultimate goal of shifting teaching time to small group instruction. The TOT uses momentary time sampling with 15-second intervals where the observer records what is seen during the first three seconds of each interval. During the moment of observation, the observer determines what the teacher is doing and saying and categorizes the teacher's behavior as "teaching" in small or whole group, providing "feedback" about student work, managing the classroom "environment" or managing student "behavior". For the purposes of this observation tool, "teaching" is operationally defined as teacher-led dialogue with the intention of imparting knowledge.

Some examples of teaching are when the teacher is introducing a lesson by explaining objectives and purpose to the students or the teacher is presenting new information to his/her students. Some non-examples of this behavior are when the teacher has students practicing previously learned skills or an aide is leading the class while the teacher does something else. "Feedback" is defined as checking and responding to student work that was completed individually or collaboratively with other students but in the absence of the teacher. Some examples of behaviors that could be coded as "Feedback" are when students are working independently and the teacher walks from one student work area to another while monitoring work completion and quality or when teachers are checking for work completion. Some non-examples of this behavior are when the teacher is sitting alone at her desk correcting papers or answering questions about an assignment. "Environment" is defined as any teacher behavior observed as they manage the classroom environment and space, such as directing students to gather supplies or line up at the door, or teaching students routines directly related to classroom operation and unrelated to academic material. Non-examples are defined as behavior management examples. "Behavior" is defined as verbal behavior directed at altering a student's behavior, either preemptively or reactively. "Behavior" could be either positive or negative; teacher actions intended to either increase or decrease the frequency of behavior were included. Some examples of behavior management are when a teacher is teaching rules, correcting misbehavior or separating students who are misbehaving. Non-examples of behavior management are environmental management behaviors.

This tool may be useful for providing data on observable teaching behaviors. Solomon, Klein, Marcotte, and Hintze (2010) found that the Time on Teaching was

sensitive to teacher behavior over time. In that study teachers were observed during the first six weeks and the last six weeks of school to look at the shift in teaching behaviors. However, using this measure for consultation comes with certain risks. The TOT has not be studied enough to know how many observational periods are necessary to elicit data reliable enough to draw valid conclusions of classroom activities. Additionally, it has not previously been tested with consultation or as a method for providing performance feedback to teachers.

One purpose of this study is to examine the consequential validity of the Time on Teaching. Messick (1995) defined consequential validity as the aspect of construct validity that "appraises the value implications of score interpretation as a basis for action as well as the actual and potential consequences of test use, especially in regard to sources of invalidity related to issues of bias, fairness, and distributive justice" (p. 745). This refers to the appropriateness of any action that is taken based on the results of a measure. In terms of the TOT, establishing consequential validity of the measure will be a necessary step in using it to help change teacher behavior.

Teacher behavior is a product of the teacher's education, past experiences, environment and student behavior. Teacher behavior is an alterable variable in the classroom that many consultation studies use as the dependent variable of the consultation treatment. Professional development workshops typically do not lead to lasting behavior change in teachers even though this is a common way to provide teacher training (Codding & Smyth, 2008). However, methods for changing teaching behavior and assessing the effects the changes have on students are still understudied. The role of the student in changing their teacher's behavior has been mostly studied in terms of

whether negative student behavior can increase teacher reprimands. Sherman and Cormier (1974) found a functional relationship between student and teacher behavior when studying these negative student behaviors. In this study, teacher use of time will be considered an alterable variable. Using consultation with performance feedback, teachers will be guided towards changing their ratio of time spent teaching, managing the environment, managing behavior or providing feedback.

Statement of the Problem

Time is a precious commodity in schools where all too often time allocated for instruction must contend with time needed to manage classroom environments, student behavior, and other logistical demands involved with teaching and schooling. Even when allocated instructional time is protected for teaching, research demonstrates that students are only engaged during a small percentage of instructional time (Gettinger & Ball, 2008; Hollywood et al., 1995), necessitating the need for more instructional time. When instructional time is protected, students have more opportunities to learn. Teachers often lack the time, the self-evaluative skills and the resources to effectively assess how they use their own allocated instructional time. Most teachers know they do not have enough time to teach each school day, but few can effectively determine where more minutes can be gained. Through teacher and student observations, this study was designed to increase the amount of time teachers are engaged in instruction by providing teachers with performance feedback on their use of time, as observed with the Time on Teaching, and how it relates to student on-task and off-task behavior, as observed with the Behavior Observation of Students in Schools (BOSS).

Research Questions

There are three primary research questions that were addressed in this study. The first set of questions addresses how each subsequent phase of the multiple baseline design affects teachers' behaviors during allocated instructional time. The first question explored how adding visual inspection of performance feedback changed teacher behavior. It was hypothesized that teachers would increase their use of teaching behavior following visual inspection of their own teaching behaviors via TOT data. The next question examined whether adding consultation to the performance feedback will further change teacher behavior. It was hypothesized that consultation combined with visual inspection of the TOT would lead teachers to increase their teaching behavior more so than visual inspection of their data without consultation. Lastly, consultation was faded in order to see if teacher behavior change could be maintained. It was hypothesized that changes in teacher behavior would be increased and sustained once consultation has ended.

The second set of questions addressed the relationship between student behaviors and teacher behaviors. On- and off-task student behavior was explored during the various teaching behaviors in order to see whether the student behavior varied as a result of changes in the teaching behavior. It was hypothesized that an increase in student off-task behavior, as observed with the BOSS, would be observed when the teacher was engaged in behavior management, environment management, feedback or not teaching, as observed with the TOT. It was also hypothesized that an increase in instructional time as observed with the TOT would lead to an increase in on-task student behavior as observed with the BOSS.

The last set of questions addressed the social validity of the TOT for use in teacher consultation. The first question examined whether the TOT provides data that is useful in consultation and as performance feedback as rated by teachers on a survey post-experiment. It was hypothesized that data from the TOT would yield information that was useful in consultation and performance feedback, as rated by teachers on a survey post-experiment. The second questioned whether changes in teaching as measured by the TOT yield qualitative changes in how a classroom functions based on teacher survey and observer judgment based on the Likert scale on the TOT. It was hypothesized that data from the TOT would yield data that was useful in making changes in how a classroom functions, as rated by teachers on a survey post experiment.

CHAPTER 2:

LITERATURE REVIEW

School psychologists are spending an increasing amount of time in schools devoted to consultation since it is an effective use of time. Through consultation, a school psychologist can help one teacher who might in turn help hundreds of students (Erchul & Martens, 1997). However, following consultation the school psychologist cannot be sure that the teacher is following through with the intervention as discussed. One method for ensuring treatment integrity is the use of performance feedback, which is defined in the literature as feedback that an individual receives following observation of a specific behavior or target (Noell et al., 2005). This serves as a permanent product that can be useful in showing teachers feedback on their performance or tracking whether or not an intervention has taken place. Data used for performance feedback can also be collected through behavioral observation of the teacher or the students. Information gathered through observation can then be used to assist teachers in creating meaningful changes in their practice. This literature review will summarize the three components of this study: consultation, performance feedback and direct observation.

Consultation Methodology

Consultation has its roots in Israel following World War II. Gerald Caplan first documented consultation in psychology literature during the years 1949-1952 when he found his staff overwhelmed by the tremendous need for psychological services. His small staff was expected to coordinate services for approximately 16,000 adolescent immigrants. Through consultation methods, he created a model of triage services so that those with the greatest needs received the most help. Caplan developed a prevention

model similar to those used today in the fields of education and public health. By classifying people in terms of the intensity of their needs, Caplan was also able to serve more people and provide additional help through his consultants (Erchul, 2009; Erchul & Martens, 1997). The same philosophy holds true in schools. Using consultation, we indirectly help students by working through their teachers. This allows for many more students to receive help, provided that the teacher applies what they learn from one consultative case to another (Kratochwill, Elliott, & Callan-Stoiber, 2002).

There are various models of consultation with competing philosophies and methodologies. While there are differences in these various methods of consultation, they all focus on providing indirect services and using a collaborative relationship where school psychologist and teacher or school psychologist, teacher and parent work together (Kratochwill et al., 2002). Some of the main models of consultation are mental health, organizational, behavioral, conjoint behavioral, and instructional (Zins & Erchul, 2002).

Mental health consultation began with Caplan in the 1940's when he used his small staff to meet the needs of thousands of immigrant children. This model is not widely used in schools because it is routed in a psychodynamic philosophy. Problems are seen as deeply rooted in how a consultee perceives their situation and understands their own beliefs. Additionally, mental health consultation focuses on the use of community mental health resources rather than school based resources (Erchul & Martens, 1997). The major assumptions of this model are: consultation can alter a teacher's perceptions, this change will lead to a change in both teacher behavior and student behavior, and changes in teacher behavior can be generalized to other situations. Mental health consultation can be teacher or student centered (Lewis & Newcomer, 2002). Though not

widely used in the schools, this model has been studied in the preschool and early childhood setting. Perry, Dunne, McFadden, and Campbell (2008) used mental health consultation to assist childcare providers in dealing with specific children's behavior problems in order to prevent expulsion. Following an observation and rating scales, the behavior specialist developed an intervention plan targeting each child's problems. Through consultation with the childcare worker, the behavior specialist helped put the plan in place and track its progress. Results showed an increase in positive social skills, but more importantly fewer children were expelled from the early childcare program following this intervention. This type of consultation is intensive, requiring a tailored intervention for each child (Perry et al., 2008).

Organizational consultation is practiced on the system level. It works like consultee-centered consultation where the goal is to improve the functioning of the consultee, but the entire school is the consultee. The school psychologist in this role works to implement new school wide initiatives. The goal of system-centered consultation is to help improve the functioning of the school as a system. Curtis and Stollar (2002) have identified phases of systems change. First comes systems readiness where you must figure out what your system needs and get it ready for change. Next is the implementation phase where new programs are put into place. Following this is institutionalization, which means that new practices have become engrained within the system. Finally, there is the evaluation stage where you step back and evaluate the changes you've made (Curtis & Stollar, 2002).

Bergan and Kratochwill's (Bergan, 1995) behavioral consultation model utilizes problem-solving steps as the frame for consultation. The consultant works through the

four steps of their model to solve a problem - problem identification, problem analysis, intervention implementation and program evaluation. At each step in this model, there is a corresponding teacher interview to further glean information about the problem (Bergan, 1995). Research has demonstrated that by defining the problem well, we increase the likelihood that the problem will get solved (Bergan, 1995). This model is sometimes called Problem Solving Consultation, and it is rooted in behaviorism (Kratochwill et al., 2002). Although there is a large body of evidence for the effectiveness of behavioral consultation, more studies need to be done to ascertain whether or not skills learned in this model are generalized by teachers (Kratochwill et al., 2002).

Conjoint behavioral consultation is an extension of behavioral consultation that includes the student's family. This form of consultation builds a partnership between teachers and parents around a particular social, behavioral or academic problem the student is facing. Together they set observable goals and work to create meaningful change through communication and a shared focus on the student's progress (Sheridan, Erchul, Brown & Dowd, 2004). The philosophy behind this model is ecological systems theory. Students exist and function in various systems such as home and school. Changes in one system affect the other ones as well. A problem exists not within a child, but within an interaction they are having in a given system. This type of consultation promotes consistency between the home and the school as well as a collaborative relationship (Sheridan, 1997). Research on CBC has found positive effects for improving student outcomes in behavior, academic and social areas (Garbacz et al., 2008; Guli, 2005). Weiner, Sheridan, and Jenson (1999) studied the effects of CBC and a structured

homework intervention on the accuracy and completion of middle school students' math homework. Using a multiple baseline design across participants, the authors measured the effectiveness of this intervention at improving the students' math homework. The participants included five students, their parents and the math teachers. Results show a consistent improvement in homework completion for four of the students, while the last student's data shows more variability. Accuracy on the math homework improved for all students following the intervention. Additionally, similar to other research on CBC, results showed that teachers, parents and school psychologists found CBC to be an acceptable method of service delivery (Garbacz et al., 2008; Weiner et al., 1999).

Another popular consultative method is the instructional consultation model, which allows school psychologists to deliver on the job professional development. Instructional consultation was originally developed as a means for changing teacher behavior. This method relies on the collaboration between the teacher as the consultee and the school psychologist as the consultant. Similar to behavioral consultation, this model follows the problem-solving steps. However, within instructional consultation the focus is on the instructional triangle, which has the student, task and instruction at each corner. The consultant works with the teacher to create a match between these three variables. The goal of this type of consultation is to work on the alterable student variables, instructional methods, and specific classroom activities (Rosenfield, 2008). This model has been extended to include instructional consultation teams that meet together to review consultation cases and monitor progress. Instructional consultation has demonstrated effectiveness in the literature by reducing special education referrals

(Gravois & Rosenfield, 2006), increasing student goal attainment and providing teachers with professional development (Rosenfield, 2008).

Many recent studies using consultation do not adhere to a specific methodology or provide enough information about the structure of the consultation to allow for replication (Sheridan, Welch, & Orme, 1996). Research on consultation is taking place, but the term consultation can mean a variety of strategies if not properly defined. Sheridan et al. (1996) conducted a review of consultation studies published in 1985 to 1996. They found that 28% of the studies used a model of consultation that was not well known and 11% did not specify which model they used. These studies accounted for a large number of neutral results suggesting that a clearly articulated model of consultation is a necessary ingredient for strong effects (Sheridan et al., 1996).

Blom-Hoffman and Rose (2007) suggest adding Motivational Interviewing (MI) to school based consultation in order to boost outcomes. Miller and Rollnick (2002) developed an MI procedure to help people dealing with addiction. Through their research they found individuals mandated to enter therapy, but often they were not ready to change so the therapy would fail. MI is a style of talk that assesses willingness to change and helps to resolve ambivalence around change. MI has been used effectively with adolescents and adults battling alcohol and drug addiction (Blom-Hoffman & Rose, 2007; Brown & Miller, 1993).

MI is only just beginning to be used in the schools with teachers. Reinke, Lewis-Palmer, and Merrell (2008) used MI and performance feedback in the Classroom Checkup to help teachers increase use of praise. The MI components used in this study include developing a menu of options for behavior change collaboratively. Results

showed this intervention was effective at changing teacher behavior and improving student behavior. Gueldner and Merrell (2011) also used MI coupled with performance feedback to increase teacher use of the Strong Kids curriculum. This study used the strategy of developing a menu, reviewing data, delivering praise statements and setting a goal. Results showed high levels of teacher integrity. Additionally, teachers rated the performance feedback and MI procedure as acceptable. Both studies clearly defined the content of their consultation procedures unlike many other consultation studies (Sheridan et al., 1996). However, further research is needed to determine if using MI in conjunction with performance feedback in an effective consultation strategy.

The consultation that typically takes place within a study on performance feedback does not fall into a category such as behavioral consultation, instead these brief meetings with a consultant are serving as consultation. The model of consultation described in studies utilizing performance feedback includes a 3-5 minute meeting where the researcher presents a graph of data to the teacher as consultation. While the brief nature of this consultation is admirable, this interaction contributes to a growing body of research that suggests a greater need for clarification and specificity in defining consultative services. The consultation involved in performance feedback studies includes the two major components of consultation: indirect service delivery and collaboration. Consultation alone is not effective at increasing teacher use of new interventions or teaching strategies (Gresham, 1989). Instead, a follow up strategy such as performance feedback is needed to boost treatment integrity.

Performance Feedback

Performance feedback was first documented in organizational psychology (Balcazar, Hopkins, & Suarez, 1985) and continues to be studied in a variety of fields such as education, and various branches of psychology. Balcazar et al. (1985) conducted an extensive literature review of research on performance feedback in organizational psychology. This research centers on the use of performance feedback in improving job performance in a variety of occupational settings. School-based research using performance feedback typically focuses on improving delivery of an intervention or increasing treatment integrity of supplemental interventions. Alvero, Bucklin, and Austin (2001) updated this literature review and his findings converge with Balcazar et al. (1985) in terms of the type of performance feedback that is most effective and the necessary frequency at which it is given. Both Balcazar et al. (1985) and Alvero et al. (2001) found that graphic feedback is more effective than verbal feedback alone. Also, they found that the effectiveness of feedback given daily as compared to weekly was inconsequential, suggesting that weekly feedback is sufficient. Unfortunately, both literature reviews found that performance feedback is defined differently in many articles creating a range of possible explanations for every finding. Also, both reviews noted that few studies use performance feedback without goal setting, making it difficult to tell whether the feedback alone is enough to result in a change or if goal setting is responsible for the variance observed in the studies (Alvero et al., 2001; Balcazar et al., 1985).

Performance feedback has become popular in school based research and practice because of its demonstrated effectiveness in other fields (Balcazar et al., 1985) and the continued need to increase treatment integrity in school based interventions and

consultation (Gresham, 1989). Schools are a workplace setting with employees and supervisors who monitor their performance. Studies on performance feedback in organizational psychology primarily focus on this workplace relationship, but within the education setting this research can be extended further. Performance feedback in education is typically studied in the context of treatment integrity, which remains an important issue in consultation for researchers and practitioners to consider when planning an intervention. Treatment integrity, in this context, refers to the degree to which teachers implement an intervention or treatment accurately (Noell et al., 2000). Gresham and Kendall (1987) reviewed consultation studies and did not find any that supplied treatment integrity information, instead they found that many relied on the "consult and hope" strategy (Gresham, 1989). Consultation services were provided, but no follow up was done to ensure that teachers implemented the treatment as prescribed. This has improved in recent years. Sanetti, Gritter and Dobey (2011) conducted a review of the school psychology literature for interventions with children from 1995 to 2008, the authors reported that 50% of the studies reported quantitative treatment integrity data for intervention adherence; 14% of the studies stated that they monitored treatment integrity, but they did not include quantitative information. The authors concluded that the field is beginning to accept the need to monitor TI. While these results are encouraging, a sizable 37% of studies did not indicate any type of TI monitoring. The collection of TI data should be encouraged in research and practice. Some of the reasons why treatments are not carried out as planned are because of complexity, number of treatment agents, time, resources, perceived effectiveness or motivation of treatment agent (Gresham, 1989).

One way of ensuring treatment integrity, is to use a follow-up strategy with teachers such as performance feedback.

Performance feedback is one of several well-studied follow-up strategies to use with consultation. Noell et al. (2005) studied the effects of three follow-up procedures on treatment fidelity following behavioral consultation: weekly follow up, commitment emphasis and performance feedback. In this study, behavioral consultation cases concerning task engagement, challenging behavior and academic skills were randomly assigned to follow-up conditions. Each intervention ran for three weeks. The weekly follow-up condition included a brief meeting between the teacher and consultant. Data were only reviewed upon request of the teacher. Commitment emphasis included weekly meetings plus a social influence procedure where the consultant would put pressure on the teacher to implement the intervention. The third condition included meetings coupled with visual performance feedback of treatment fidelity and student behavior. Researchers collected data for all conditions on treatment integrity, student outcomes (academic or behavioral), and teacher social validity. Results showed the teachers in the performance feedback condition demonstrated significantly higher treatment integrity than teachers in the other conditions. Additionally, students whose teachers received performance feedback made the greatest improvements in their behavior or academic performance. Results showed that performance feedback outperformed the other follow up strategies and increased treatment integrity following behavioral consultation on academic or behavior issues (Noell et al., 2005). Performance feedback is an easy to implement follow up strategy to consultation that can greatly improve treatment integrity.

This literature on performance feedback can be divided under several dimensions such as the defining characteristics of the feedback, the frequency and duration of the feedback and who delivers the feedback (Scheeler, McAfee, Ruhl, & Lee, 2004).

Performance feedback Used to Improve Behavior and Academic Outcomes

Research on performance feedback in consultation has targeted improving students' academic and behavioral outcomes through increasing the treatment integrity of interventions. If an intervention is performed with integrity, then it has a better chance of causing the desired changes. In these studies, the consultant worked through the teacher to increase treatment integrity, thereby improving the likelihood that the students received the treatment as it was intended. Whether or not a teacher uses an intervention as intended affects student performance. There are many reasons why a teacher might fail to do all the necessary steps of an intervention. For example, the logistical demands of an intervention might be too complex or the teacher may not fully understand the intervention (Gresham, 1989).

In several studies (Duhon, Mesmer, Gregerson ,Witt, 2009; Gilbertson, Witt, Singletary & Vanderheyden, 2007; Mortenson & Witt, 1998; Noell, Witt, Gilbertson, Ranier, & Freeland, 1997; Noell et al., 2000; Witt, Noell, LaFleur & Mortenson, 1997) teachers were shown data on the academic performance of students, as well as their own treatment integrity data in an effort to increase teacher use of the intervention. Performance feedback was found effective at increasing student work completion (Witt et al., 1997) student accuracy (Witt et al., 1997), reading comprehension (Noel et al., 2000), math performance (Gilbertson et al., 2007), and academic performance related to an intervention (Duhon et al., 2009). Performance feedback increased teacher use of

academic interventions (Duhon et al., 2009; Mortenson & Witt, 1997). Mortenson and Witt (1998) is a good example of the method used to study performance feedback. In this study the authors used performance feedback to increase teacher adherence to pre-referral academic interventions. This study used a multiple baseline design across teachers. Performance feedback meetings included the review of both treatment integrity data and student performance data. Researchers hoped to find a relationship between increased treatment integrity and student academic performance, but the results showed inconsistent findings. Some students responded better to the intervention than others, but some teachers also implemented the intervention with greater fidelity. Feedback did increase implementation fidelity, but this did not result in improved outcomes for all students in the study (Moretenson & Witt, 1998).

In the studies mentioned above, teachers received performance feedback individually from a consultant. Duhon et al. (2009) chose a different format for delivery. Duhon et al. (2009) used the pre-referral team meeting as a place for sharing of performance feedback. Their rationale for using this procedure was that a weekly team meeting was logistically more feasible and the public nature of their performance feedback may hold the teachers more accountable for their data. Results showed performance feedback was effective at increasing treatment implementation and improving student performance, but teachers' use of the intervention faded when performance feedback was removed (Duhon et al., 2009).

The previously mentioned studies include the use of both teacher-level and student-level data. Ball and Gettinger (2009) compared the effects of performance feedback that included both student level data and teacher level data with performance

Feedback that just included teacher level data. This study took place in Kindergarten classrooms and used the Dynamic Indicators of Basic Literary Skills (DIBELS) scores to measure academic progress. There were two conditions, teachers receiving their students' DIBELS scores and teachers receiving the scores and consultation. The consultation condition included a meeting following data collection at each benchmark period where student data were reviewed and each student's scores were examined for risk status. Results showed that teachers who received feedback on their students' DIBELS scores had better student outcomes in the spring benchmarking period than teachers who just received their students' scores. Results of this study suggest that performance feedback with consultation given to teachers about student performance can lead to changes in student outcomes (Ball & Gettinger, 2009).

Taken together, performance feedback can be an effective tool for increasing teachers' use of academic interventions. While the majority of the studies paired student data with teacher data, Ball and Gettinger (2009) compared the effects of both. Their findings suggest that teachers will ultimately make the most changes in their treatment integrity after viewing student-level data. Several studies (Moretenson &Witt, 1998; Noell et al., 1997) reported inconsistent findings in student outcomes. This could be because varying levels of treatment integrity mean the student's intervention was not carried out as intended. Or this might mean the measurement used was not sensitive to changes in student performance. Further research is needed to determine whether small changes in teacher's treatment integrity can create meaningful differences in student outcomes.

Researchers have also found performance feedback to be effective for improving the behavior of students through increasing treatment integrity for interventions such as behavior management plans. These studies use a similar structure as the academic-oriented ones described above. Several studies (Codding, Feinberg, Dunn & Pace, 2005; Noell, Duhon, Gatti & Connel, 2002; Rodriguez, Loman & Horner, 2009; Sanetti, Luiselli & Handler, 2007) used consultation coupled with performance feedback to increase teacher follow-through of behavior interventions for students with disruptive behavior. Codding, Livanis, Pace and Vaca (2008) extended their previous research to examine the effectiveness of performance feedback at increasing teachers' treatment integrity to class-wide behavior plans. In this study, Codding et al. (2008) used a one-way mirror to study the effects of observer reactivity. The researchers observed whether teachers followed the behavior plan as written through a one-way mirror for fifty percent of the observations. Performance feedback increased treatment integrity to 100% for all teachers. There was no difference in teacher-level data for sessions where the observer was visible, suggesting that the teachers were not sensitive to observer presence. Unfortunately, the authors did not collect data on whether student behavior improved as a result of this intervention (Codding et al., 2008).

In another study, DiGennaro, Martens, and McIntyre (2005) examined whether teachers could improve their treatment integrity for behavior intervention plans by using a type of negative reinforcement, attendance at consultation meetings. Teachers with poor treatment integrity received performance feedback, while teachers who maintained high levels of treatment integrity did not have to sit through consultation sessions. If the teacher fell below 100% in treatment integrity, they met with the consultant the next day

for a review of the data, and repeated rehearsal of their missed steps of the plan. The observers monitored whether the teacher followed the plan and for student on-task behavior throughout all phases of the study. The researchers found some improvement in student behavior as a result of this study. Teacher compliance with the intervention was sensitive to performance feedback. Teachers also reported that this system of negative reinforcement was acceptable to them (DiGennaro et al., 2005). In another study using a similar negative reinforcement strategy, DiGennaro, Martens, and Kleinman (2007) tested the effects of performance feedback on teachers' implementation of a behavior plan to address student problem behavior. Each of the four teachers met with the consultant and developed a behavior plan for their target student. Throughout all phases of the study, the teachers' fidelity of implementation and the students' problem behavior were observed using partial-interval recording. This study differed from its predecessor by including a separate performance feedback phase where all teachers received feedback on their student's progress. During this phase, teachers did not receive feedback on their treatment integrity. The following phase consisted of teacher-level performance feedback data coupled with meeting cancellation. Teachers who performed all steps of the behavior plan were exempt from meetings, while teachers who failed to reach 100% met with the consultant and reviewed their performance. Teachers needed three consecutive days of perfect treatment integrity before moving on to the final phase. Results showed that teachers benefitted from consultation sessions as well as performance feedback in order to maintain high levels of treatment integrity (DiGennaro et al., 2007).

Sanetti, Luiselli, and Handler (2007) compared the effects of verbal and graphic performance feedback. The first author conducted classroom observations using an

integrity-monitoring sheet to see whether or not the behavior plan was being carried out as planned. This study used an A-B-BC-B-BC reversal design to test the effects of the various forms of performance feedback. During baseline the teachers received training around implementation of the behavior support plan. When the intervention began, observations continued and were followed by either verbal performance feedback or graphic and verbal performance feedback. These feedback sessions lasted approximately five minutes, regardless of which type of performance feedback they included. Results showed that verbal feedback alone was not effective at changing teacher treatment integrity even when this feedback was given immediately following an observation. Graphic feedback combined with verbal feedback resulted in the most change for levels of implementation. The researchers also suggest offering performance feedback sessions immediately after an observation is more effective than on another day or the following week (Sanetti et al., 2007). Scheduling an observation and scheduling a meeting time for a feedback session can be time consuming for teachers, but not everyone can fit in a feedback meeting after an observation. Results of this study also showed improved student behavior when treatment integrity was highest, meaning that the student's behavior improved as a function of the intervention (Sanetti et al., 2007).

Performance Feedback and Behavior Specific Praise

The previously mentioned studies detail ways in which performance feedback can indirectly affect student behavior through improving teacher adherence to interventions or new teaching methods. Performance feedback has also been used to change specific teacher behaviors such as use of praise in order to improve student behavior. A common premise to the behavior analytic approach (Alberto & Troutman, 2003) has shown that

praise statements can be effective at decreasing negative behavior in students. Yet it is difficult for teachers to give students more praise than criticism when their behavior is challenging. Using more praise statements can decrease negative behaviors and increase positive behaviors in students (Alberto & Troutman, 2003).

Cossairt, Hopkins, and Hall (1973) taught teachers to use praise for attending behaviors, such as work completion and hand raising in order to increase student engagement. Researchers provided teachers with performance feedback on both their use of positive language and their students attending behavior. Results showed an increase in both variables as a result of the training and performance feedback (Cossairt et al., 1973). In a similar study Martens, Hiralall, and Bradley (1997) taught teachers to use goal setting to improve student behavior. Teachers developed goals around increasing their use of behavior specific praise. The consultant helped the teacher choose target behaviors to observe and praise when completed correctly.

Several studies (Hawkins & Heflin, 2011; Hemmeter, Snyder, Kinder & Artman, 2011; Mesa, Lewis-Palmer & Reinke, 2005; Reinke, Lewis-Palmer & Martin, 2007; Sutherland, Wehby & Copeland, 2000) worked to increase teacher use of praise statements in an effort to increase on-task behavior of students and decrease off-task behavior. Results from these studies showed increase use of praise statements by teachers and decreases in disruptive student behavior.

Sutherland et al. (2000) and Hawkins and Heflin (2011) performed their studies in classrooms with students with emotional and behavioral disorders (EBD). Previous research had shown that rates of praise statements were lower in classrooms of students with EBD than in general education classrooms, when these students demonstrate the

highest rates of off-task behavior (Sutherland et al., 2000). Both of these studies demonstrated that performance feedback was effective in increasing teachers' use of praise statements. Sutherland et al. (2000) found student on-task behavior increased as a result of this intervention but Hawkins and Heflin (2011) did not collect any student level data. Duchaine, Jolivette, and Fredrick (2011) conducted a similar study in a high school inclusion setting. Results showed increases in teacher use of behavior specific praise and student on-task behavior, indicating that this intervention is effective for teachers of general education students as well as special education students.

The majority of these studies took place in elementary schools or high schools. However, Hemmeter et al. (2011) used performance feedback to increase teacher use of descriptive praise in a preschool setting and they used email to deliver the performance feedback. Results showed that this type of feedback delivery was effective at increasing teacher use of praise (Hemmeter et al., 2011). This finding suggests that performance feedback is an effective method for increasing teacher use of praise statements regardless of the grade level.

Myers, Simonsen, and Sugai (2011) also attempted to increase teacher's use of praise statements, but they used a different format than the previously mentioned studies. They used a multiple baseline design structured according to a Response-to-Intervention model for teacher support. Based on observed ratio of praise statements, the teachers were provided more intensive support for intervention implementation where they received increasing levels of instruction and feedback on their use of praise statements. All four teachers started at baseline, referred to as tier 1 in the study, but then moved through the intervention at a difference pace depending on what their data showed. Based

on teachers' response to the intervention, they were supplied with intensified levels of feedback. Researchers observed teachers for behavior specific praise statements, general praise statements and negative interactions using a frequency count for fifteen minutes. Following this observation, researchers observed academic engagement, off-task behavior and disruptive behavior in students using a ten-second partial interval recording system. Results showed a range in response to performance feedback, which supported their hypothesis that teachers require a range of professional development offerings and dosage. Results also showed that negative student behaviors decreased as a result of this intervention suggesting that increased levels of teacher praise created changes in the classroom (Myers et al., 2011).

Performance Feedback Used to Increase Academic Engagement

Several studies have used performance feedback to increase student levels of academic engagement in the classroom (Cossairt et al., 1973; Leach & Conto, 1999; Wilczenski, Sulzer-Azaroff, Feldman, & Fajardo, 1987). Similar to the previously mentioned studies, this intervention targets teacher behavior but aims to change both the teachers and the students. Academic engagement is a more difficult construct to measure than disruptive behavior or reading comprehension scores. For the majority of these studies, academic engagement is defined as on-task student behavior, which can be increased through changing teaching strategies (Cossairt et al., 1973; Leach & Conto, 1999; Wilczenski et al., 1987) or decreasing transition time (Codding & Smyth, 2008).

Cossairt et al. (1973) provided teachers with instruction in praising students for attending, and in the following phases researchers provided teachers with performance feedback on their use of the strategy and the percent of intervals that students were

attending. Results showed increases in both teacher praise and student attending behavior (Cossairt et al., 1973). Leach and Conto (1999) also compared the effects of professional development with performance feedback. Researchers led teachers through a half-day workshop to train teachers in methods to increase academic engaged time in their classrooms. Through direct observations, Leach and Conto (1999) observed which strategies teachers used and how it affected student behavior. The researchers provided the teachers with performance feedback about their strategy use and student engagement. Leach and Conto (1999) compared the effects of seeing feedback about teaching behaviors to feedback about student behaviors and found similar results. Results showed that the half-day workshop did not lead to changes in teacher behavior, but performance feedback on teacher and student behavior created behavior change in the classroom. The teachers used the feedback they received to make changes in their practice that led to increased student engagement (Leach & Conto, 1999).

In another study on increasing student engagement, Wilczenski et al. (1987) targeted three special education students who were being mainstreamed into their general education classroom. Researchers observed student behavior and presented their off-task and on-task behavior on graphs as visual performance feedback in consultation sessions. Unlike Leach and Conto (1999), this study did not use any form of teacher observation or teacher training. The only method for changing teacher behavior was seeing the student data. During consultation, teachers were encouraged to develop their own strategies for changing their data. Results showed student's academic engagement and behavior improved as a result of performance feedback (Wilczenski et al., 1987). This study used performance feedback as an intervention for changing teaching behavior. It was effective

even though procedures for increasing student engagement were not directly taught, suggesting that teachers can generate these strategies on their own when shown performance feedback (Wilczenski et al., 1987).

In another study, Codding and Smyth (2008) used performance feedback to decrease transition times in a high school classroom in order to create more opportunities for student learning and academic engagement. In a multiple baseline design across teachers, Codding and Smyth (2008) videotaped teachers and students at the high school level. Observers then coded the video segments for teacher behaviors and student behaviors. The teachers were observed for instructional time and transition time. Students were observed for on-task and off-task behavior. Following baseline observations, the consultant presented the teacher with a graph showing the number of minutes spent in transition time during an instructional period as performance feedback. The consultant set a goal of lowering transition time by 30%. During subsequent performance feedback meetings, the teacher viewed her time spent in transitions compared with the goal. Following the performance feedback phase, there was an additional phase that included performance feedback and classroom management strategies presented by the consultant. Data on student level of engagement was not shown to the teachers. As the minutes of transition time decreased through this intervention, the level of observed student engagement increased. Decreased transition time means that teachers are spending more time in instruction, which led to increases in student on-task behavior. Results were maintained as performance feedback was thinned and finally removed (Codding & Smyth, 2008).

Performance Feedback Used to Train Teachers

Performance feedback has also been used to assist teachers and paraprofessionals in learning new methodologies for improving student behavior (Auld, Belfiore, and Scheeler, 2010; Leblanc, Ricciardi, & Luiselli, 2005; Moore, Edwards, Sterling-Turner, Riley, Dubard, & McGeorge, 2002;) These studies trained pre-service teachers or paraprofessionals in new behavior management strategies such as functional analysis and then monitored their adherence to the intervention with performance feedback. Results showed that performance feedback is effective as a device for training teachers in new methodologies.

Several studies have used performance feedback to train teachers or pre-service teachers to use new teaching methodologies such as incidental teaching (Casey & McWilliam, 2008), embedded teaching (Tate, Thompson, & McKerchar, 2005), direct instruction (Coulter & Grossen, 1997), contingency trials (Scheeler, McAfee, Ruhl, & Lee, 2007) or a multi-faceted training package (Simonsen, Myers, & DeLuca, 2010). Casey and McWilliam (2008) and Tate et al. (2005) both found that performance feedback increased teacher use of their target teaching method, but neither study included a student outcome variable. It is unclear whether the changes in the teachers' behavior affected the children's' behavior.

Other studies on performance feedback have shifted teacher behavior as it pertains to the logistical demands on teaching such as paperwork and planning. Maher (1981/1982) used performance feedback to increase teachers' planning of individualized education programming and to increase compliance with written plans. Teachers greatly increased their planning and use of individualized education plans in teaching following

this intervention with performance feedback. The consultants delivering the performance feedback in this study were direct supervisors, which might have influenced the results of the study because of the influence a supervisor has over a teacher. Maher (1980) did a similar study using school psychologists and their program planning and goal setting. In this study, school psychologists were trained to write their plans and goals for weekly activities in the schools. Then their follow-through with planning and goal setting was monitored with performance feedback from their supervisors. This increased the school psychologists' ability to plan a program completely, as defined by Maher (1981/1982). This study did not address whether more complete program planning led to improved student performance or better psychological services.

Feedback Delivery

Performance feedback can be delivered via various mediums such as electronic, verbal, written or graphic. The person delivering the feedback can be a peer, outside consultant or supervisor. Feedback can also be delivered immediately such as in the using bug in the ear technology (Scheeler et al., 2007), daily, weekly or less frequently. These various dimensions of performance feedback delivery affect the outcomes. Balcazar et al. (1985) and Alvero et al. (2001) found that the majority of studies in organizational psychology relied on a supervisor or manager providing the feedback. This condition is also highly associated with strong effects for performance feedback. Unfortunately, the school-based studies predominately used the experimenter to deliver the performance feedback rather than a person in a position of power within the school such as the teacher's supervisor. However, the experimenter serving as the consultant in many of these studies was often from outside the school, which might mean that they possessed

expert power (Erchul & Martens, 2002). More research needs to be done in order to examine the effects of the individual delivering feedback.

The method for delivering feedback continues to evolve in the research. Hemmeter et al. (2011) used email to provide performance feedback to preschool teachers on their use of praise statements in a preschool classroom. This method was effective at changing teacher behavior. Other studies have used teacher mailboxes or in-person meetings to deliver feedback. With teacher's schedules becoming busier, and email becoming a primary form of communication in schools, electronic delivery of feedback will become more common. Simonsen et al. (2010) surveyed teachers in their study about their preferred methods of receiving feedback. Their choices were written feedback in their mailbox, brief verbal meetings or e-mail. Two of the participants chose verbal feedback, while the third participant chose e-mail.

In another study surveying teachers about their preferences, Easton and Erchul (2011) asked 89 teachers about their preferred methods for receiving feedback. The surveyed teachers rated e-mail, phone and written feedback as neutral, while in person feedback was rated acceptable. Respondents also rated school psychologists higher in acceptability for delivering performance feedback than principals or vice-principals. Teachers also preferred weekly feedback to daily or less frequent feedback (Easton & Erchul, 2011). Feedback that occurs less than weekly may lose its relevance. While feedback that occurs daily can be taxing on a busy teacher's schedule. Barton, Kinder, Casey, and Artman (2011) reviewed the various forms of feedback and guide the reader through choosing the best fit for their intervention and teacher population. They suggest email because it allows for the inclusion of text, video, graphics and an interactive

element such as a question. Additionally, email allows teachers to review their feedback when it is convenient for them and to take time to process the information (Barton et al., 2011). Disadvantages of email feedback include the inability to tell whether or not a teacher has received the feedback. Also, some teachers are not comfortable using email technology and prefer to have feedback in a hard copy form (Barton et al., 2011).

Research is needed to determine which types of feedback are most effective at changing behavior. Sanetti et al. (2007) did a study comparing verbal and graphic plus verbal feedback. This study had three phases of performance feedback: verbal, verbal + graphic and then a return to just verbal feedback. The condition with verbal and graphic feedback showed the highest rates of treatment integrity. Further research should be done where the various types of performance feedback are compared. It is also important for practitioners to know which type of feedback teachers prefer. Various methods for delivering feedback are used within the performance feedback literature, but more research is needed to determine which methods are most effective at creating change.

Feedback and Teaching

The school-based performance feedback literature typically involves teachers receiving feedback. Unfortunately, these studies document experiments within the classroom rather than daily practice. Teachers are accustomed to giving feedback to their students about their performance and progress. Receiving feedback about their teaching has become more complicated. Teachers should receive regular feedback from their supervisors, but often this process is not completed as intended (Scheeler et al., 2004). In teacher training programs, being observed and receiving feedback is common, but in the field, this level of training and supervisory support is sometimes overlooked (Scheeler et

al., 2004). In a meta-analysis of pre-service teacher training programs, feedback following practice was the most commonly used practice (Rose & Church, 1998). Unfortunately, the authors coded whether a study included feedback, but did not create a pooled effect size for this category. Instead they describe their findings without referencing effect sizes. The researchers found that training packages that included regular performance feedback consistently led to improvements in student teaching practices. Additionally, when feedback was examined as a separate variable rather than being included in a training package, the results were even stronger. Several studies combined feedback with goal setting and yielded even stronger effects (Rose & Church. 1998). Research has demonstrated that teacher behavior can be altered through feedback. This has been tested with a variety of behaviors from increasing praise, use of direct instruction methods, following a behavior plan (Scheeler et al., 2004) or decreasing transition time (Codding & Smyth, 2008). Yet, teachers who have entered the profession are still without the necessary feedback to improve their practice.

Observation of Teachers and Students

In order to provide feedback to teachers, there needs to be some type of observation completed of their teaching. Systematic direct observation allows for an objective evaluation of the observed behaviors. Various methods of direct observation are used in research and practice to study the behavior of students. The goal of systematic direct observation is to "capture quantitatively the behavior actually taking place" (Shapiro, 1996). Other forms of observation, such as naturalistic observation, are less precise and afford more opportunities for subjectivity. For example, a teacher might describe a child as being rude and disruptive during lessons. This description from the

teacher may be useful data since it tells the observer something about the teacher's opinion and motivation. By using a form of systematic direct observation, this assertion can be proved or disproved with quantitative data.

In order to do conduct a systematic observation, the behaviors being observed must be clearly and finitely defined. Behaviors that are defined too broadly will not be observed accurately (Shapiro, 1996). Systematic observation requires that behaviors be defined operationally, which means the behavior is objective, observable and measureable (Merrell, 2008; Shapiro, 1996). There are different methods for conducting systematic direct observation. Some common forms are event recording, interval recording, duration or latency recording and time sampling. Event recording is used when the observer records the number of times a behavior occurs in a given observational period. This method is used when the behavior has a clear beginning and an end such as the number of times a student hits or calls out.

When behaviors are too difficult to record as a frequency count in event recording procedures, time sampling procedures can be used. Time sampling procedures are used when the observer divides the observation into intervals and records whether or not the behavior has occurred at the defined interval. In interval recording procedures the observational period is divided into equal brief intervals and the observer either records behaviors that occur during the entire interval or during just a part of the interval. These methods are used for behaviors that occur at a moderate rate such as out of seat behavior or off-task behavior. Duration recording procedures are used when the observer records how long a behavior lasts. This is useful when observing behaviors that happen less frequently such as tantrums or screaming. Latency recording procedures are used to

record the amount of time that elapses before a behavior occurs. Latency recording is useful for measuring noncompliant behaviors, such as the time between the request and compliance. Momentary time sampling is used when the observer divides the observation into intervals and records whether or not the behavior has occurred at the initial moment of each interval. Momentary time sampling is most useful for behaviors that occur at a moderate but steady rate (Merrell, 2008).

Observing Teachers

Observing teachers for research or performance evaluation provides information about effective teaching practices as well as contextual variables that influence student achievement. Various methods for observing teachers exist today. There are some observation tools geared primarily towards different aspects of teaching. For example, the T-POT is designed to measure teacher-student relationships (Martin, Daley, Hutchings, Jones, Eames & Whitaker, 2010). Bondi (1970) observed teachers' talk in three-second intervals for fifteen minutes. Each interval was coded as indirect, such as asking questions or empathizing, or direct as in lecturing or providing feedback (Bondi, 1970). In another study, Stichter, Stormant, and Lewis (2009) observed teacher language for prompts, wait time and feedback using the Multiple Option Observation System for Experimental Studies (MOOSES) on handheld computers. Reinke et al. (2006) also used MOOSES to observe for teacher praise and reprimands.

Observing Teachers and Students

There are some tools that allow for the observation of students and teachers simultaneously. MOOSES (Reinke et al., 2006; Stichter et al., 2009) captures real time data on any number of variables. The observer can be collecting data on student and

teacher behavior concurrently. Wilczenski et al. (1987) used the PLA-Check to observe student engagement and teacher activity. This frequency sampling instrument uses audible prompts every thirty seconds to prompt the observer to scan the room for the following: number of students, number of students engaged or not engaged, status of the target students, and the interaction level of the teacher. The observer simply marked whether these behaviors were present or not each interval. Each of these behaviors was further defined. Of note, the variable concerning teacher-attending behavior was marked without reference to positive or negative attending behavior (Wilczenski et al., 1987). This observation instrument was not widely used in the research. Upon review, only two other peer-reviewed studies used the PLA-Check. Another tool with a similar structure is the OPTIC, or Observing Pupils and Teachers in Classrooms. This instrument takes 30 minutes to complete. The observer alternates five 3-minute segments of observing the teachers and the students to gather 15 minutes of data on each. During the 3-minute segment observing teachers, the observer uses a frequency count to record teacher responses to student behaviors. The observer listens for and codes for positive and negative responses and responses pertaining to academic or social behavior. During the student observation, the observer codes students as on-task or off-task. The observer is instructed to rotate throughout the class during each 3-minute observation (Merret & Whendall, 1986). Unfortunately, this instrument was not widely used in research. Only three peer-reviewed studies could be found that used this observation instrument.

Observing Students

Observing student behavior has become a routine part of evaluations for special education, since best practices dictate the need for multiple methods of assessment

(Hintze, 2005). Various methods of observation exist. The most commonly used forms of observation of students in schools are narratives and systematic direct observation. Narrative observations involve the practitioner entering the classroom, observing the target student and writing down all of their observations of this child. Typically practitioners conduct one thirty-minute observation (Volpe, DiPerna, Hintze, & Shapiro, 2005). Research has shown more information is needed (Hintze, 2005). When practitioners or researchers observe student behavior, they must choose between existing observation systems or develop their own observation.

Volpe et al. (2005) reviewed seven direct-observation coding schemes and found a range of reliability and validity data for each measure. The authors assert that this information is often ignored when practitioners choose an observation instrument. When choosing an observation instrument, it is important to pick a sound instrument that matches the target behavior and receive adequate training (Volpe et al., 2005).

Observations of students and teachers are completed for a variety of reasons. Sometimes observations are done diagnostically to figure out the nature of a problem. Other times observations is part of research. To understand what happens within a classroom, researchers have used a range of observational instruments to observe teachers, students and the structure of the classroom.

Previous research (Codding & Smyth, 2008) on providing performance feedback to teachers in order to change their behavior has utilized observation of student and teacher behavior to generate data for performance feedback. These data are then shown to the teachers during consultation. Taken together, these components create a powerful tool for showing teachers what is actually happening in their classrooms and allowing them to

create meaningful change through consultation.

CHAPTER 3:

METHOD

In order to increase instructional time in classrooms, researchers need to know how time is spent inside the classroom during allocated instructional time. Direct observations of teacher and student behavior provide a window into how time is used throughout the instructional period. This study used a multiple baseline design across teachers with systematic direct observations to investigate the effects of visual inspection of performance feedback and visual feedback with consultation on teacher's delivery of instruction during allocated instructional time. Additionally, this research was designed to examine the functional relationship between teacher behavior and student behavior. Both teachers and students were observed and the data from these observations were used as performance feedback during consultation to facilitate goal setting and planning between the teacher and consultant. The following section includes information regarding the participants and setting, dependent variables, procedures and the research design that were used to address these questions.

Participants and setting

The participants in this study were recruited from elementary schools in Western Massachusetts. The researcher met with principals to ask permission to disseminate a recruitment letter to teachers in Kindergarten through 3rd grades. Teachers of early elementary grade levels were selected because these represent grade levels in which classroom teachers are responsible for teaching every subject within their classrooms. Also the Time on Teaching observation tool has primarily been used to observe teaching in early Kindergarten through third grade classrooms.

Teachers received a recruitment letter detailing the study and requesting their participation (Appendix C). The recruitment letter described the procedures of the study and the time commitment that was requested of them. Teachers were informed that they would be observed three times a week and asked to meet with the consultant weekly for fifteen minutes during the consultation phase of the study. In this recruitment letter, teachers were asked to describe the schedule of their school day, when they have protected instructional time, the grade they teach and how many years they have been teaching. Teacher participation was voluntary.

The three participants selected for the study were Kindergarten, 1st grade and 2nd grade teachers. Each teacher had at least 20 years of teaching experience. Two of the teachers were new to their schools the year of this study, while the other teacher was a veteran to her school. The class sizes ranged from 16 to 18 students. All three teachers had paraprofessionals in their classroom to work with various students. The number of adults in the classroom during observations ranged from 2 to 5. Teacher A taught for 23 years. Her 2nd grade classroom had between 2 and 3 adults in it and 18 students. She primarily used whole class instruction for mini-lessons where students sat on the rug. Following the mini-lesson, students completed independent seatwork at their desks or throughout the room on the floor and she would confer with individual students. Teacher B taught for 20 years. Her 1st grade classroom had between 2 and 3 adults and 16 students. She also used a mini-lesson format followed by independent seatwork. Students always worked at their tables and she would move from one table to another to help groups of students. Teacher C taught for 27 years. Her kindergarten classroom always had 4 or 5 adults in the room and 16 students. Instruction in this room included whole

class lessons on the rug some of the time, but most observations took place during small group activities where five or six students would work with the teacher at a time. All students in the class were assigned to work with an adult for the duration for small group instruction.

Dependent Variables

Time on Teaching (TOT)

In order to observe changes in teacher behaviors, this study used the Time on Teaching observation tool. The TOT is a 30-minute, momentary time sampling observation tool that is hypothesized to be sensitive to changes in the instructional practices of the teacher. The TOT is based on the work of Gibson and Hasbrouck (2007), who developed a brief observation using a frequency count that categorized teacher behavior as either managing the classroom environment, delivering instruction, or correcting behavior. Gibson and Hasbrouk (2007) designed the measure to be used for graphic performance feedback in consultation, with the ultimate goal of shifting teaching time to small group instruction. The TOT has a 15 second interval that uses momentary sampling. At the start of each interval, the observer judges what behavior is occurring within the initial three seconds of the interval. During that time, the observer codes the teacher's talk and behavior as either "teaching" in small or whole group, "feedback", "environment", or "behavior". "Teaching" is defined as teacher-led dialogue with the intention of imparting knowledge. This does not include practicing previously learned skills. Examples of teaching include when the teacher is introducing new content or stating the learning objectives. Or the teacher could be modeling a new lesson or skill. The teacher might be re-teaching previously learned material. Teaching would also be

coded if the teacher is doing a read aloud. Teaching includes instructional dialogue where students and teachers are engaged in academic discourse.

"Feedback" is defined as checking and responding to student work that was completed individually or collaboratively in the absence of the teacher. It is different than the type of feedback given during a lesson when a teacher asks a question and a student responds. This prompt corrective feedback is coded as teaching. In contrast, feedback is coded when the teacher walks from one student to another checking work and conferring with them. Feedback is not coded if the teacher is grading assignments at her desk. Feedback is coded when teachers are providing feedback to students.

"Environment" is defined as language with the intended purpose of managing the classroom, such as directing students to gather supplies or line up at the door, or teaching students routines directly related to classroom operation and unrelated to academic material. Environment talk is a necessary part of the classroom in order to conduct the daily business of the classroom. Examples include when the teacher is passing out materials, assigning jobs or organizing students into groups.

"Behavior" is defined as verbal behavior directed at altering a student's behavior, either preemptively or reactively. "Behavior" could be either positively reinforcing student behavior or corrective in response to aversive student behaviors where the teacher's actions are intended to either increase or decrease the frequency of behavior. Examples of behavior include teaching classroom rules, sending a child to time out, responding to off-task behavior or moving students in order to respond to disruptive behavior. Behavior is also coded as a frequency count, so as to capture more occurrences of behavior correction.

The TOT also includes a global Likert-style rating of classroom quality for the observer to complete for each observation. This qualitative judgment was included in this study to test whether or not there is a correlation between observed classroom quality, the teacher's use of time and student behavior.

Behavior Observation of Students in Schools (BOSS; Shapiro, 1996)

The BOSS served as the student outcome measure. It was hypothesized, that as teacher behavior changed with consultation, there would be a class-wide shift in levels of student engagement as measured by the BOSS. This observation system uses a combination of momentary time sampling and 15-second interval time sampling to quantify students' on-task and off-task student behavior. On-task behavior is determined via momentary time sampling procedures. At the start of each 15-minute interval, the observer must decide if the student is on-task or off-task. If the student is on-task, it must be coded as either active or passive engagement. Active engagement is marked when the student is actively engaged in an academic task such as reading or writing. Academic engagement is also coded if the student is answering a teacher question or discussing academic content with another students. Passive engagement is when a student is attending to the lesson or reading an assignment, but is not actively doing anything, such as writing on an assignment. Other examples include listening to a peer answer a question, looking at the blackboard or following along on a worksheet.

After recording for on-task behavior, the observer switched to partial interval recording and observed for off-task behavior. This type of behavior is divided into off-task motor, off-task verbal and off-task passive. Off-task motor is behavior such as being out of the assigned seat. Other behaviors coded as off-task motor include drawing or

writing not related to academic task, throwing paper, aimlessly flipping pages of book or touching other students. Non-examples include swinging feet while working on assignment or leaving their seat to hand out papers. Off-task verbal is coded when the student is making comments unrelated to the academic task, or other noises such as whistling or singing. Non-examples include appropriate academic talk or laughing at a joke the teacher makes. Off-task passive is coded when the child is staring out the window. Typically a target child is selected for observation using the BOSS and is observed exclusively for on-task and off-task behavior, except every fifth interval a pre-selected child is observed for comparison (Shapiro, 1996; Volpe et al., 2005). For the purposes of this study, students were randomly sampled throughout the observation period. Each interval the observer switched which student they observed to get a representative sample of the entire class's off-task or on-task behavior. Every student in the classroom was observed at least once.

Procedures

Observation sessions

Observations were conducted three times a week for 12 weeks in the consultee teachers' classrooms. Observation periods lasted thirty minutes for a total of ninety minutes of observation time each week. Each observation period included at least two observers in order to complete both observation instruments. One observer observed the students using the BOSS while the other observed the teacher using the TOT.

During recruitment, the teachers identified the time allocated for instruction throughout the school day. These instructional periods were randomly sampled for observation. Teachers were told to expect observers during their instructional blocks as

identified on their recruitment survey. Each week teachers were informed about the day and time that they would be observed.

During an observation session, each observer entered the classroom and found an unobtrusive location where they could sit or stand side by side. They began the observation at the same time while sharing an audio cue through a splitter to ensure that they were observing the same moment. One observer was focused on the teacher using the TOT, which uses a tone to prompt the observer every fifteen seconds to observe. The other observer used the BOSS to observe students. Each interval the BOSS observer switched which student he or she was observing to sample the behavior in the classroom. The BOSS observer was also prompted with a tone every fifteen seconds. Both observers had headphones plugged into the shared MP3 player in order to hear the signal for observing. Undergraduate and graduate students served as observers in this study. Fifteen percent of the observations included a third observer to measure inter-observer agreement.

Inter-observer Agreement

All observers were trained by the researcher and practiced with videos of teachers and students until they reached 90% agreement on the measures. This training took several hours as the observers learned the definitions for each behavior on the TOT and the BOSS and then practiced observing. Throughout the study, a third observer was present in the classroom for 15% of the observations on teachers and 15% of the observations on students in the study to establish inter observer agreement on the measures. Additionally, halfway through the study all observers received a refresher training on the TOT and the BOSS.

Consultation

Face-to-face consultation occurred weekly during the consultation phase of the study. During this time, the consultant followed a set of written procedures to document the session (Appendix A). This served as a permanent record of the consultation meetings for the researcher and the teacher. A copy of the meeting procedures was given to the teacher at the first consultation meeting along with the visual performance feedback of the TOT and BOSS. During consultation, the consultant reviewed the data with the teacher, provided a minimum of three praise statements, generated and selected from a menu of options for increasing teaching time and set goals for the following week.

These consultation procedures used elements of Motivational Interviewing (Miller & Rollnick, 2002), such as collaboratively developing a menu of options, setting goals and using praise. The first step in the consultation procedures was to review the data from the teacher observations. The teacher was guided through data interpretation through the question "What do you notice looking at your data?" and "What did you spend the most time doing?" The next step was to examine the student observation data with the same questions in mind. The praise statements were inserted between the steps of the data review.

After the data review, the teacher and researcher collaboratively selected several items from the menu of options for increasing instructional time that they generated starting with the first consultation session. This served as a menu that was referred to during each consultation session. Each teacher had a slightly different menu since they collaboratively generated the items on the list with the researcher. After selecting from

the menu, the teacher and the researcher set goals for the following week based on the data.

Experimental Design

This study used a multiple baseline design across teachers to evaluate the effectiveness of using performance feedback to increase teaching time as observed on the TOT and decrease off-task behavior as observed on the BOSS. This study consisted of four phases: baseline, visual performance feedback e-mailed, visual performance feedback with consultation and fading. The relationship between changes in teaching time as a function of teacher behavior and student engagement as a function of teacher behavior was examined by comparing proportions of these variables as observed by the TOT and the BOSS.

Phases

Phase 1 - Baseline: Student and teacher behavior was observed in each of the three classrooms.

Phase 2 – Visual Inspection of Performance Feedback: During this phase data gathered during the classroom observations were emailed to the teacher so she could examine her data following each observation.

Phase 3 - Visual and Consultative Performance Feedback: Each week, the teacher and consultant met once for approximately 15 minutes and followed a predetermined set of procedures that include review of performance feedback data, a minimum of three praise statements, selecting several strategies for increasing instructional time from a menu generated by the participant and the researcher, and goal setting. These procedures are outlined in Appendix A.

Phase 4 - Fading: Once the teacher's trend line appeared stable, the meetings were stopped and she continued to receive performance feedback via e-mail.

Treatment integrity

Treatment integrity was established by using a consultation procedures checklist. The teacher also had this list of procedures before the intervention. The procedure checklist, as shown in Appendix A, was reviewed at each consultation session. Both the teacher and consultant had these procedures visible during consultation.

Treatment acceptability

Treatment acceptability was assessed through a teacher survey at the end of the intervention. Teachers were asked to assess how they felt about the changes in their classrooms and whether or not they were meaningful. Teachers also rated how helpful consultation was to improving their practice and student outcomes and behavior. See Appendix B.

Data Analyses

This study utilized a multiple baseline design across teachers. Results were analyzed using a variety of methods depending on the research question. Each method of analysis is summarized below the corresponding research question along with the hypothesis for that question.

The first set of research questions examined changes in teacher behavior as a result of visual inspection of the TOT data, visual inspection plus consultation and the removal of consultation. The data from each phase change were analyzed separately. It was hypothesized that teachers would make changes in their behavior following visual inspection of their own teaching behaviors via TOT data. It was also hypothesized that

consultation combined with visual inspection of the TOT would lead teachers to change their behavior more so than visual inspection of their data without consultation. Finally, it was hypothesized that changes in teacher behavior would be sustained once consultation has ended.

All three questions were answered through visual inspection of the graphs generated from the multiple baseline design. The graphs were examined for mean level changes, shifts in level and trend, and the latency of the change. Kazdin (1982) explains that graphs showing dramatic changes as a result of the intervention need not be scrutinized to this degree. For these research questions, the researcher examined graphs for changes in the mean shifts in behavior to determine whether the data followed the predicted pattern. The researcher also examined whether there was a shift in level, or "discontinuity of performance from the end of one phase to the beginning of the next phase" (Kazdin, 1982). Through examining the trend, the hypotheses were reviewed for each teaching behavior to see if the intervention had the predicted effect. Lastly, the researcher examined the latency of the change in order to see how quickly behaviors changed with each phase (Kazdin, 1982).

Visual inspection can be unreliable, so the data were also analyzed using an analysis of the mean difference between intervention phases and by examining the improvement rate difference, IRD. The calculation is based on the minimal number of data points that need to be removed from either adjacent phase to create complete non-overlap between phases. The effect size is labeled a "risk-difference" and it ranges from negative one to one. This method yields an effect size that can be compared to results to other studies (Parker, Vannest, & Brown, 2009). The IRD effect size is calculated by

identifying the minimum number of data points from phase A and phase B to remove all overlap. Next, the number of data points to be removed is called improved and put in a ratio of improved over not improved. Their difference is calculated as the Improvement Rate Difference. Parker et al. (2009) cite six reasons for using the IRD. The analyses directly relate to visual inspection, and can be computed with hand calculations. IRD can be interpreted easily using known benchmarks and the method has been established in the research. It does not require parametric assumptions and confidence intervals can be calculated.

The second set of research questions were designed to examine the relationship between student behavior and teacher behavior. Specifically, during which type of teacher behavior, observed using the TOT, does off-task student behavior, as observed with the BOSS, occur at the highest frequency? It was hypothesized that an increase in student off-task behavior, as observed with the BOSS, would be observed when the teacher is engaged in behavior management, environment management, feedback or not teaching, as observed with the TOT. The null hypothesis states that there would be no difference in student behavior, as observed with the BOSS, as a result of the type of teacher behavior being observed with the TOT. This question was answered through comparing proportions between each of the teacher behaviors observed with the TOT and off-task student behavior as observed with the BOSS.

This study also looked at whether increases in instructional time, as observed with the TOT, effected changes in student behaviors such as increases in on-task behavior and decreases in off-task behaviors, as observed by the BOSS. It was hypothesized that an increase in instructional time as observed with the TOT would lead to an increase in on-

task student behavior as observed with the BOSS. The null hypothesis states that there would be no difference in on-task behavior as a result of the amount of instructional behavior being observed with the TOT. This question was answered through comparing the proportions between amount of instructional time in minutes and amount of on-task student behavior in minutes as observed with the BOSS.

The last set of questions addressed the social validity of the TOT observation tool for use in teacher consultation. The first question investigated whether the TOT provided data that was useful in consultation and as performance feedback as rated by teachers on a survey post-experiment. It was hypothesized that data from the TOT would yield information that is useful in consultation and performance feedback. This question was analyzed through a qualitative analysis of answers on the Teacher survey shown in Appendix B where trends and patterns in the teacher responses were examined.

This study was also designed to investigate whether changes in teaching as measured by the TOT yield qualitative changes in how a classroom functioned based on teacher survey and observer judgment based on the Likert scale on the TOT. It was hypothesized that data from the TOT would yield data that is useful in making changes in how a classroom functions. This question was analyzed by examining the Likert scale description of teaching quality on the TOT and through a qualitative analysis of answers on the Teacher survey shown in Appendix B where trends and patterns in the teacher responses were examined.

CHAPTER 4:

RESULTS

Research Questions

This study was designed to examine a functional relationship between student and teacher behavior while providing teachers with performance feedback on their teaching behaviors. Another aim of this study was to assess whether the TOT can be used for consultation and performance feedback purposes. Research questions are organized under three broad domains: changes in teaching behavior as a result of the intervention, the relationship between student behavior and teacher behavior, and the social validity of the TOT observation tool. This section will be organized according to the research questions.

Inter-Observer Agreement

Inter-observer agreement varied by type of teaching behavior observed. Agreement for Teaching was 82%, for Feedback 66%, for Environment 50%, for Behavior 57% and for No Teaching agreement was 50%. When corrected for chance using Cohen's Kappa, agreement for Teaching was 68%, for Feedback 37%, for Environment 9%, for Behavior 22% and for No Teaching 9% (Kazdin, 1982). Teaching was the most frequently observed behavior, and perhaps the easiest to observe using momentary time sampling procedures. The less frequent behaviors of behavior management and environmental management were more difficult to reliably observe with these same procedures. Observers, using the modified form of the BOSS, agreed 91% of the intervals on whether the student was on-task. Agreement for off-task behavior was 73%. When corrected for chance using Cohen's Kappa, agreement for On-task behavior

was 80% and Off-task behavior was 55%. On-task behavior happened most frequently so there were more opportunities for agreement.

Table 1

IRD Effect Sizes and Confidence Intervals

Teacher A	Teaching	Feedback	Environment	On-Task	Off Task	Behavior Freq.
Baseline – Phase 2	-.67 [-.89, -.33]*	.17 [-.33, .67]	.61 [.17,-1]	-.78 [-1, -.44]*	-.72 [-1, -.33]*	.33 [-.17, .78]
Phase 2 – Phase 3	-.65 [-1, -.29]*	.53 [.07, .89]*	.64 [.26, -1]	-.18 [-.65, .29]	-.4 [-.78, .07]	.42 [-.04, .78]
Phase 3 – Phase 4	.21 [-.25, .88]	-.50 [-.88, -.12]*	-.21 [-.88, -.25]*	-.75 [-1, -.38]*	.88 [.62, 1]*	.42 [-.25, 1]

Teacher B	Teaching	Feedback	Environment	On-Task	Off Task	Behavior Freq.
Baseline – Phase 2	-.46 [-.79, -.08]*	.25 [-.17, .67]	-.46 [-.74, -.01]*	-.67 [-.92, -.42]*	-.46 [-.83, -.04]*	.71 [.38, 1]*
Phase 2 – Phase 3	.20 [-.33, .71]	.59 [.18, 1]*	.20 [-.34, .71]	.46 [-.02, .88]	.46 [.05, .88]*	.35 [-.18, .88]
Phase 3 – Phase 4	.38 [-.27, .80]	-.57 [-.86, -.39]*	.52 [-.10, .10]	.52 [-.14, 1]	.71 [.43, 1]*	-.80 [-1, -.4]*

Teacher C	Teaching	Feedback	Environment	On-Task	Off Task	Behavior Freq.
Baseline – Phase 2	.45 [-.02, .86]	-.64 [-.84, -.18]*	-.26 [-.64, .14]	.29 [-.17, .71]	.57 [.29, .86]*	-.53 [-.85, -.23]
Phase 2 – Phase 3	.38 [-.12, .86]	-.29 [-.69, .24]	.38 [-.12, .86]	-.24 [-.71, .26]	.40 [-.07, .86]	.31 [-.23, .86]
Phase 3 – Phase 4	.05 [-.57, .67]	-.25 [-.61, .39]	.52 [-.14, 1]	.38 [-.29, 1]	.24 [-.43,.86]	-.71 [-1, -.29]*

Combined Weighted Mean	Teaching	Feedback	Environment	On-Task	Off Task	Behavior Freq.
Baseline – Phase 2	-.18 [-.47, .11]	-.10 [-.38, .19]	-.11 [-.39, .18]	-.34 [-.63, -.05]*	-.15 [-.44, .14]	.18 [-.11, .48]
Phase 2 – Phase 3	-.06 [-.40, .27]	.31 [-.02, .63]	.42 [.09, .75]*	.02 [-.31, .34]	.11 [-.22, .44]	.37 [.03, .71]*
Phase 3 – Phase 4	.21 [-.24, .63]	-.43 [-.84, -.03]*	.25 [-.16, .67]	.01 [-.40, .43]	.62 [.20, 1]*	-.28 [-.72, .16]

*Significant Effect Size

Figure 1: Percent of Intervals Observed Teaching

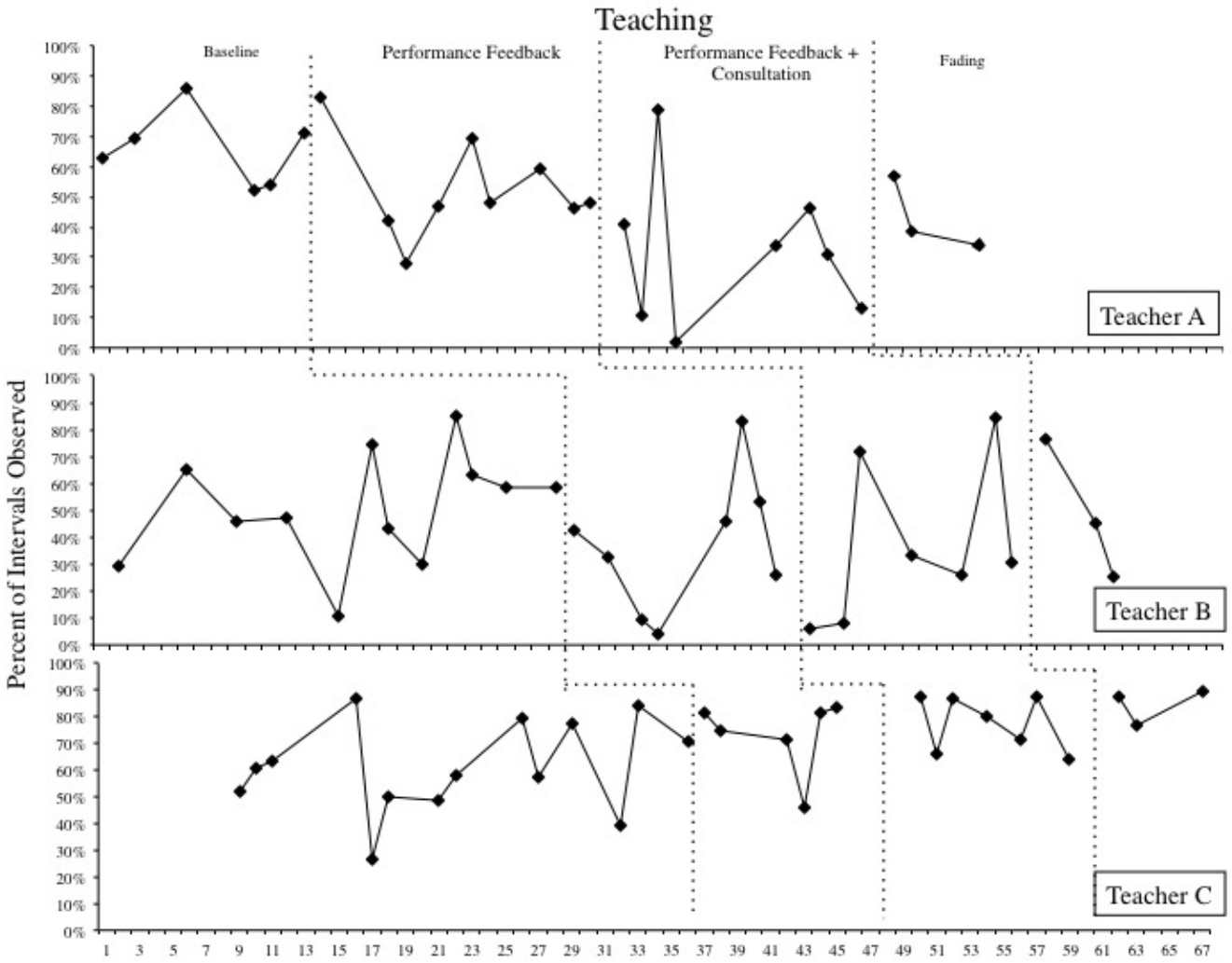


Figure 2: Percent of Intervals Observed of Feedback

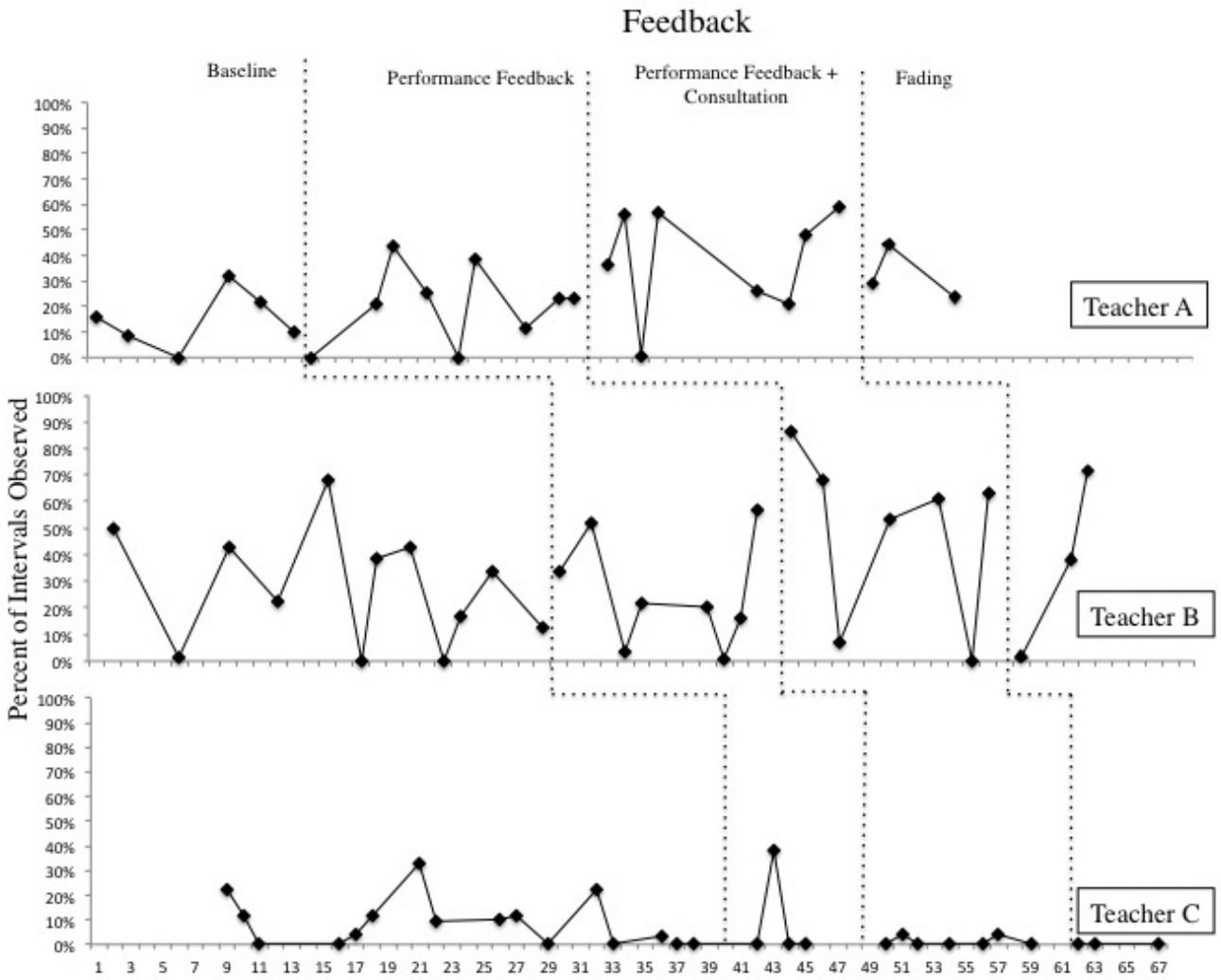


Figure 3: Percent of Intervals Observed of Environment Management

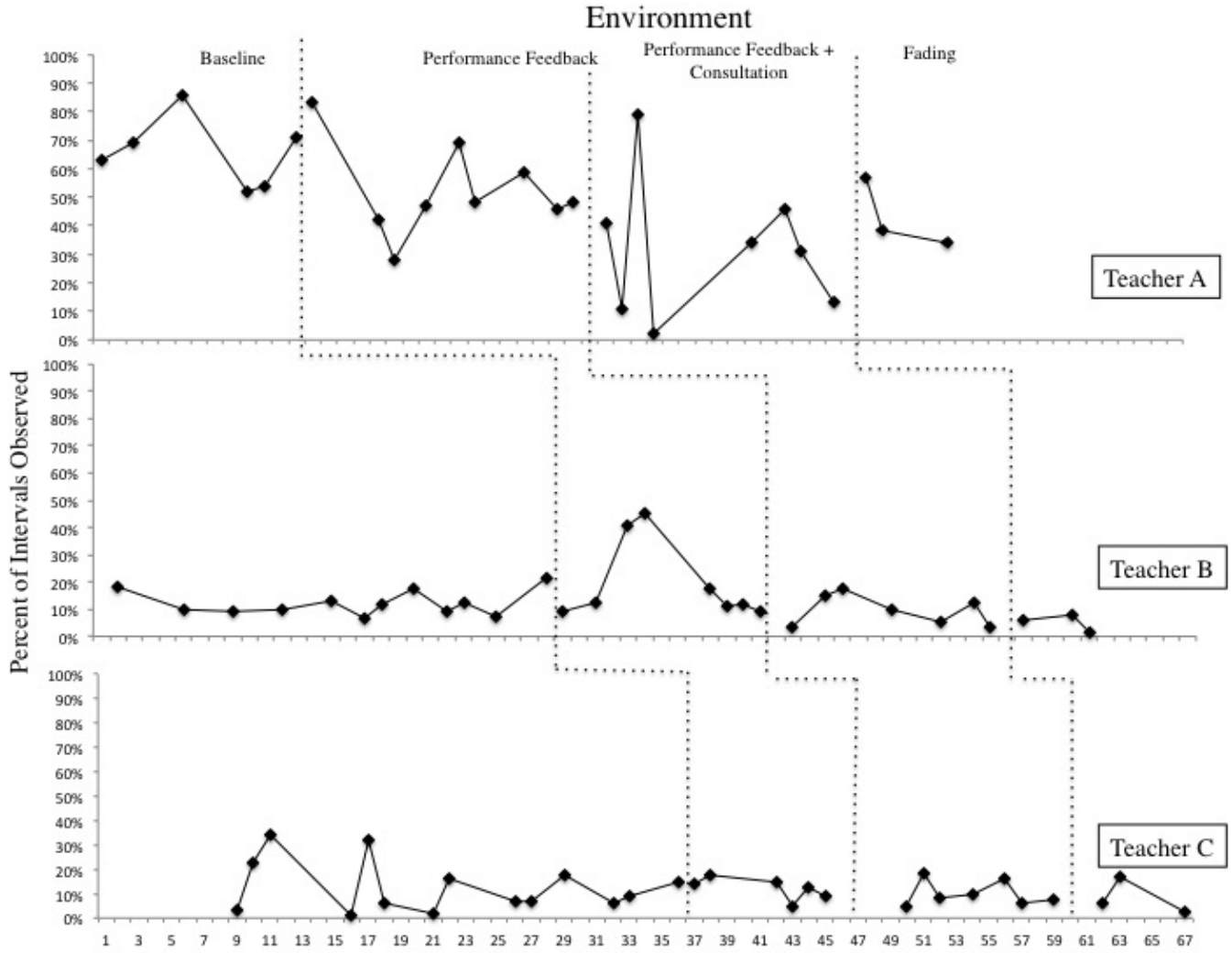


Figure 4: Percent of Intervals Observed in Behavior Management

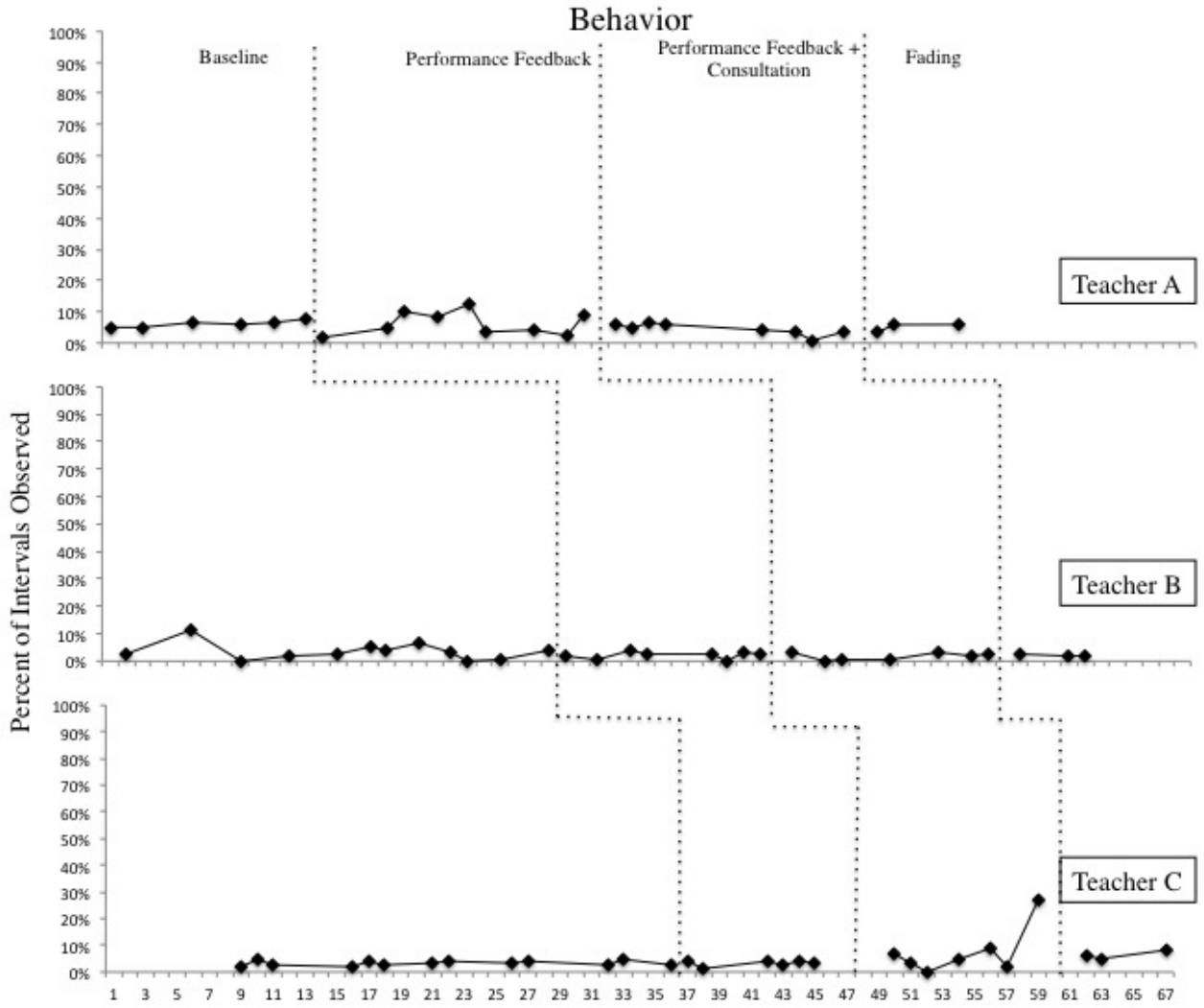


Figure 5: Percent of Intervals Observed in On-Task Teacher Behavior

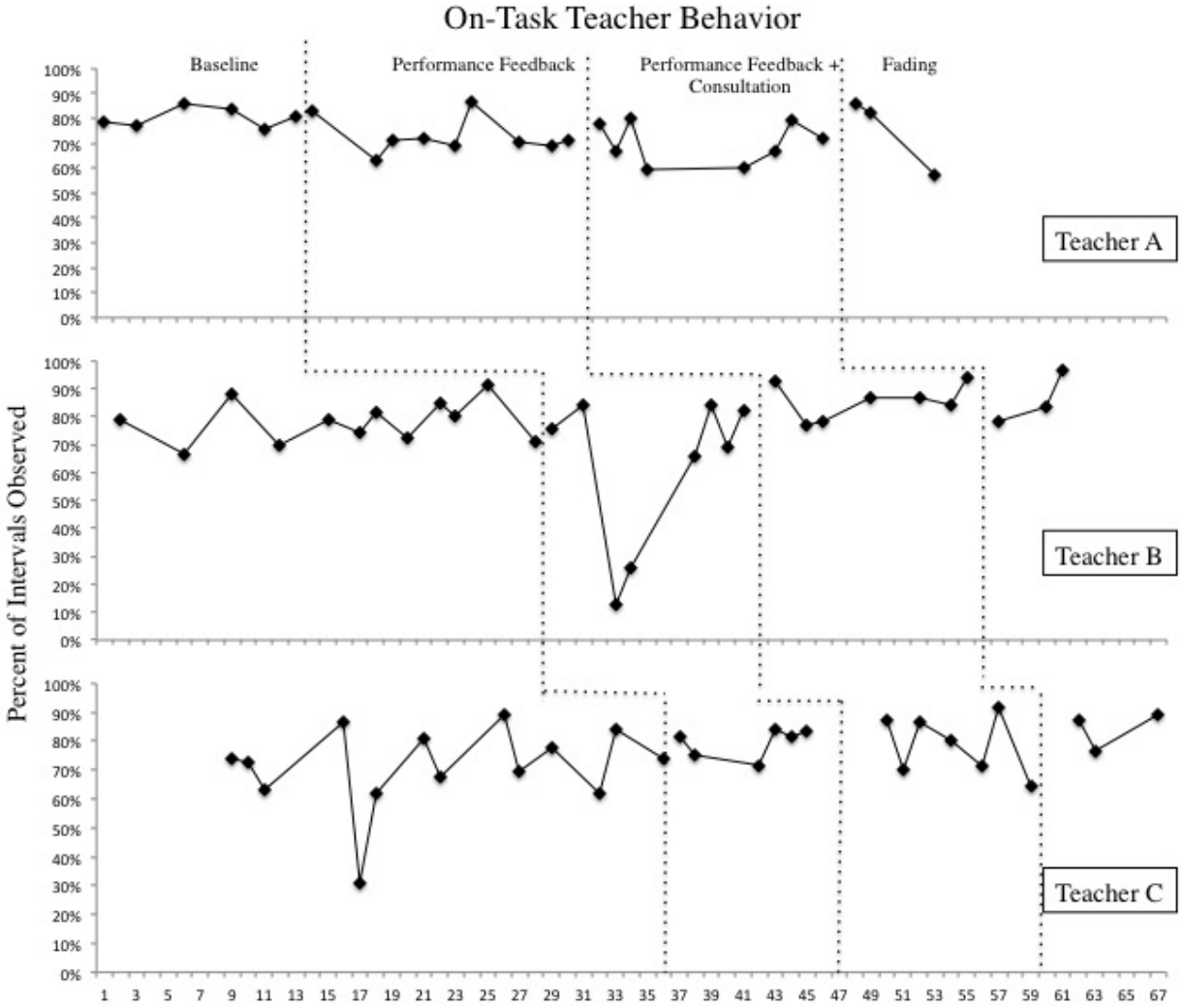


Figure 6: Percent of Intervals Observed in Off-Task Teacher Behavior

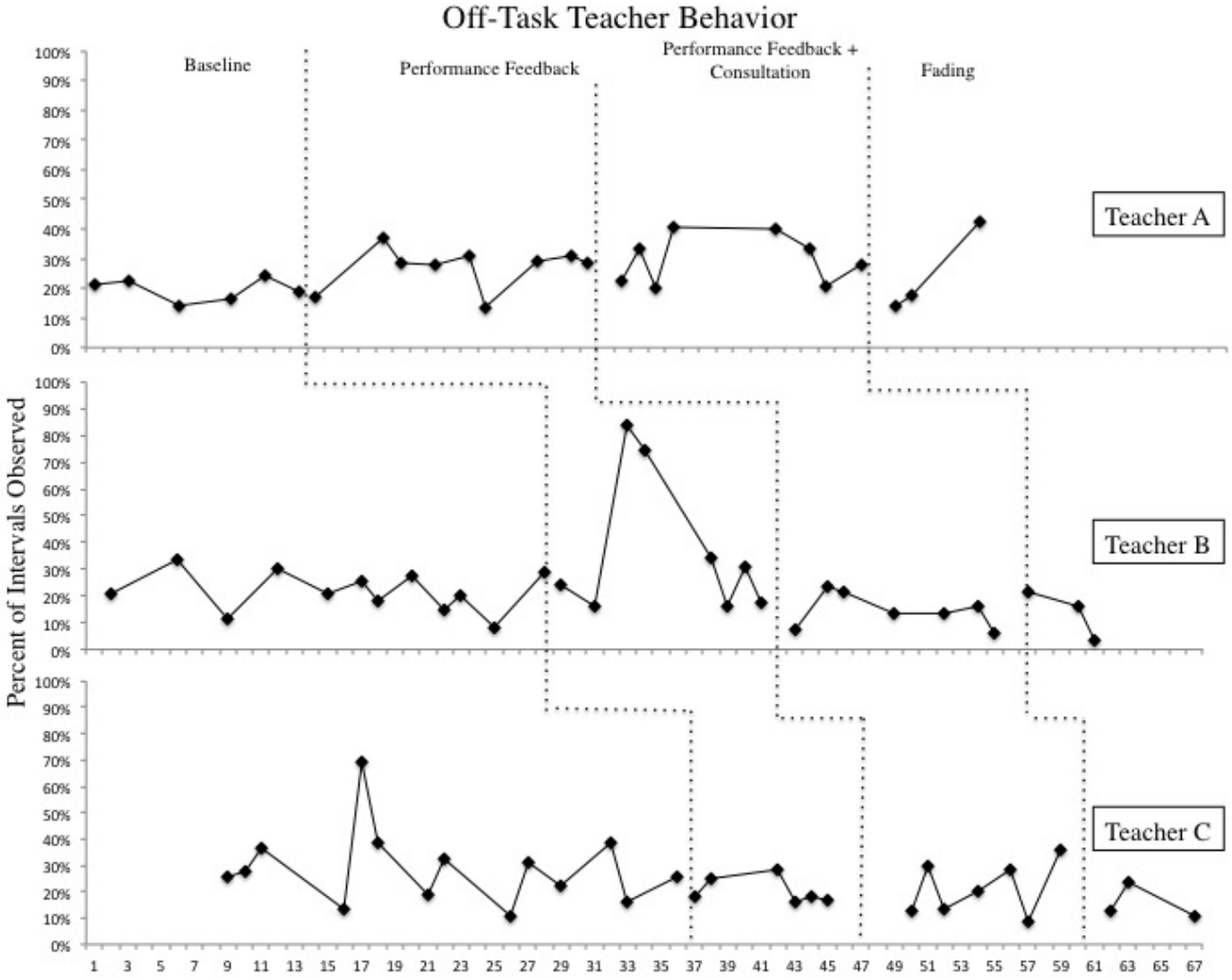


Figure 7: Percent of Intervals Observed of Student On-Task Behavior

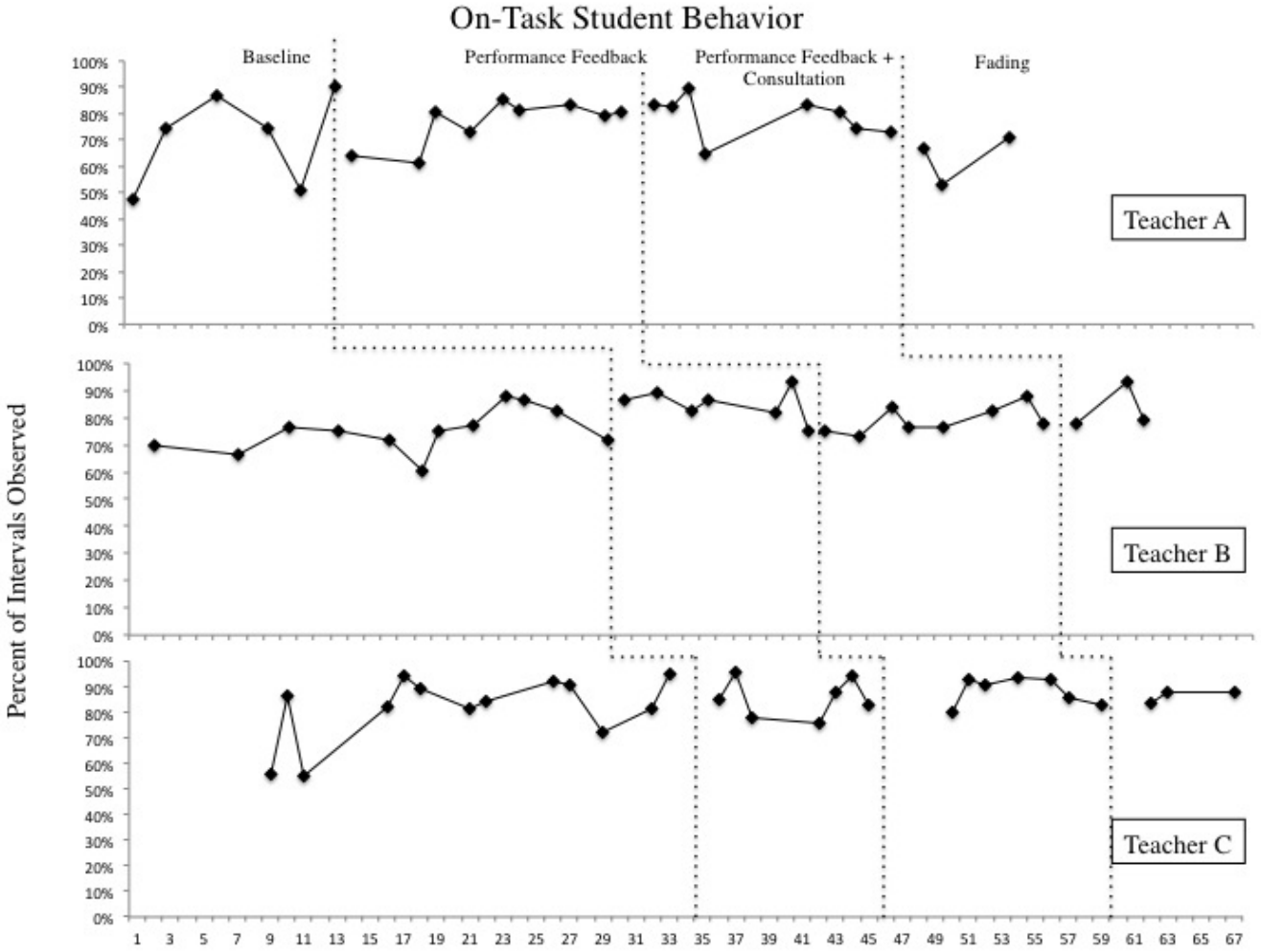
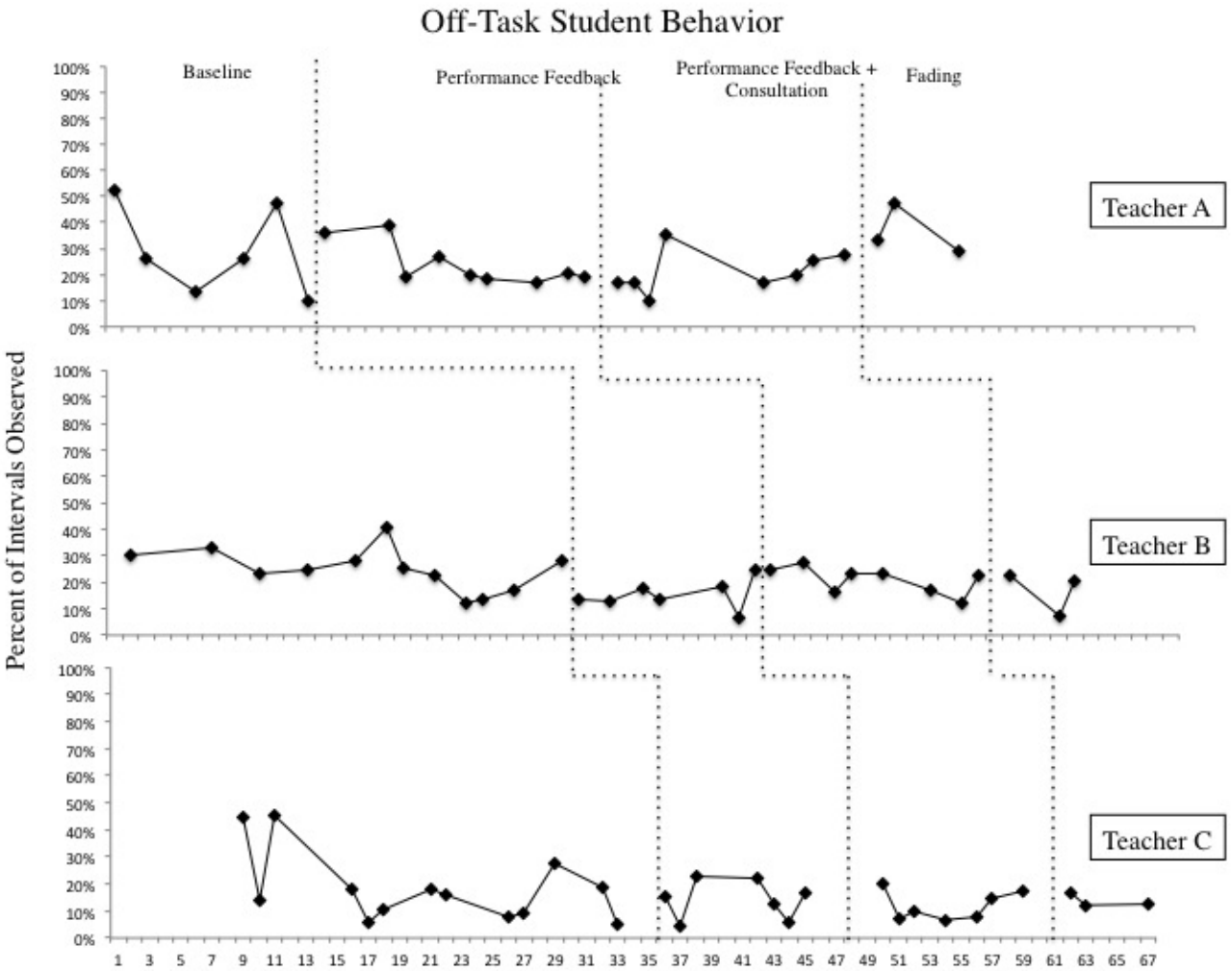


Figure 8: Percent of Intervals Observed in Off-Task Student Behavior



Changes in Teaching Behavior

The Effects of Phase 2: Visual Inspection of Performance Feedback on Teacher Behavior

It was hypothesized that teachers would increase their teaching behavior following visual inspection of their TOT data. Graphs generated from the multiple baseline design are shown in Figures 1-8. The graphs show variability in the data. The graphs for each teaching behavior will be discussed separately in terms of visual inspection, mean level differences (Kazdin, 1982), and improvement rate difference (IRD). Effect sizes are also in Appendix E, shown in Table 1. Observed levels of teaching behavior changed, but the direction of the change was not always as expected, nor was there desired consistency between all three teachers.

Teaching. Figure 1 shows observed levels of Teaching, with whole group and small group combined, featuring an increase in teaching as a result of visual inspection of performance feedback in two of the three teachers. Teacher A's data shows a change in mean and a level shift, but a negative trend. The hypothesis was that teachers would increase their use of teaching behavior when shown their performance feedback, yet Teacher A's data shows a marked decrease in use of teaching. The latency of this behavior change shows an effect, but the second data point immediately after the phase change reverts to low levels of observed teaching. Teacher A's average percent of intervals observed teaching during baseline was 66%. This fell to an average of 52% observed intervals teaching in phase two when visual inspection of performance feedback was added. Teacher A's improvement rate difference (IRD) showed performance

feedback having a negative contribution to teaching behaviors. From baseline to performance feedback, the effect size was -.67, [-.89, -.33], which suggested that performance feedback contributed a moderate negative effect to decreasing observed instructional time.

This difference between whole group and small group instruction was important for this teacher. At baseline, Teacher A's average percent of intervals observed in whole group instruction was 54%. This fell to 36% when visual inspection of performance feedback was added, and remained between 29%-32% throughout the remainder of the study while consultation was added and then removed. Teacher A's average percent of intervals observed in small group instruction was much lower. At baseline, she was engaged in small group instruction for 3% of observed intervals. With the addition of visual inspection of performance feedback, this rose to 16%.

Teacher B's average number of intervals observed teaching did not vary as much as Teacher A. Teacher B's data shows a mean and a level shift, but there is no noticeable trend. Again, the hypothesis was that there would be increases in teaching time at phase two, but Teacher B decreased her teaching. The latency of this change also shows an immediate decrease in observed levels of instruction following the addition of visual performance feedback. At baseline, Teacher B taught for 51% of the observed intervals on average. In phase two when visual of performance feedback was added, this dropped to 37%. Teacher B's IRD shows performance feedback having a small effect on decreasing teaching time, -.46 [-.79, -.08].

Teacher B's whole group and small group teaching data shows more variation. At baseline, observations showed Teacher B teaching the whole class for an average of 33%

of the intervals. Following visual inspection of performance feedback, this went down to 11%. Teacher B's rate of whole group teaching went up to 18% of the observed intervals on average with consultation and remained near that level through fading. Observations showed Teacher B devoting an average of 18% observed intervals to small group teaching at baseline. This increased to 26% following visual inspection of performance feedback.

Teacher C's average number of intervals observed teaching increased with each subsequent phase. Teacher C's data shows a mean and level shift. The trend line is sloping upwards, which is the desired direction. The latency of this change was longer than with the other two teachers. At baseline, Teacher C's average percent of observed intervals teaching were 61%. With visual inspection of performance feedback, Teacher C's average observed intervals of teaching increased to 73%. Teacher C's IRD of .45, [-.02, .86] shows small effects for increasing teaching, but the confidence intervals include zero, which means the findings cannot be interpreted. Teacher C's whole group data followed a different trend. It decreased from 24% of observed intervals at baseline and then remained relatively constant at 12% of the intervals observed through the various phases. Teacher C's small group instruction was where there were increases in observed intervals teaching. At baseline, observations show Teacher C teaching a small group for 37% of the intervals. When visual performance feedback was first added, this increased to 61%.

Feedback. The graph showing observed levels of feedback given to students shows two of the three teachers increasing their use of feedback in phase two, while the third decreased, as seen in Figure 2. Teacher A's data shows a shift in mean and level,

and a small positive slope. The latency of this change was close to the phase change. Teacher A's average percent of intervals observed giving feedback during baseline was 15%. During the visual inspection phase, observations reveal Teacher A giving feedback during 21% of the intervals on average. From baseline to the first intervention phase, the effect size was .17, [-.33, .67], which suggested that visual inspection contributed a small effect to increasing observed use of feedback, but the confidence interval includes zero, which suggests that this finding is not significant.

Teacher B's average percent of intervals observed giving students feedback was 27% at baseline. This went down slightly to 25% during the visual inspection phase. Teacher B's data shows a level and mean shift, but no clear trend line. Teacher B's IRD shows a similar trend to Teacher A. From baseline to performance feedback, the effect size was .25, [-.17, .67], which suggested that visual inspection of performance feedback contributed a small effect to increasing observed use of feedback, but the confidence interval includes zero, which suggests that this finding is not significant. The percent of intervals observed decreased, but the IRD effect size was positive because the two are calculated differently. The percent of observed intervals is simply an average of the intervals of observed. Whereas the IRD is calculated through a visual process that accounts for overlapping points and the large range of data points.

Teacher C did not use feedback in her teaching nearly as much as the other teachers. Her data does not show a mean or level shift, and the trend line is flat. At baseline, observations reveal that Teacher C gave feedback during 10% intervals. This decreased to 6% with visual inspection of performance feedback. Teacher C's IRD effect

size of -.64, [-.84, -.18] shows that visual inspection of performance feedback contributed a moderate effect for decreasing observed use of feedback.

Teaching and Feedback. Teaching and Feedback were also combined to yield a composite score for on-task teaching behavior, shown in Figure 5. The combined score yielded interesting results for two of the three teachers. Teacher C, a Kindergarten teacher, simply did not use much feedback in her teaching, which isn't surprising considering the age of her students. This will be explained further in the discussion section.

At baseline, observations show that Teacher A's was engaged in on-task teaching 80% of the intervals. When visual inspection of performance feedback was added, the percent of intervals observed on-task decreased to 73%. There was a level shift, and a small change in trend as well. The latency of this change was several data points after the phase change. The IRD effect size was -.78 [-1, -.44], which indicates a strong relationship between visual inspection of performance feedback and decreased levels of on-task teaching. Teacher B was engaged in on-task behavior for 78% of the observed intervals at baseline. This fell to 63% when visual inspection of performance feedback was added. There was a shift in level and an altered trend. Teacher B's phase two data shows a positive trend line. The latency of this change was several data points into the intervention. The IRD effect size was -.67 [-.92, -.42], which also shows a strong negative relationship between on-task teaching and visual inspection of performance feedback. Teacher C's was engaged in on-task teaching for 71% of the observed intervals at baseline. During phase two, this increased to 80% of the observed intervals. Teacher C's data shows a mean and level shift, as well as a positive trend line. The latency of this

change was immediate, but then it fell to Baseline levels. Teacher C's IRD effect size was .29 [-.17, .71], which suggests a small positive relationship between phase two and on-task teaching. However, the confidence interval includes zero making this finding impossible to interpret.

Data from all three teachers yielded a weighted IRD of -.18, with a 95% confidence interval of [-.47, .11] between baseline and performance feedback. The intervention may have had a small negative effect on teacher use of teaching, but the confidence interval includes 0, which means this finding is insignificant.

Environment. The graph showing observed levels of environment management shows two of the three teachers decreasing their use of environment management in phase two, while the third increased. This graph is shown in Figure 3. Teacher A's average observed levels of environment management ranged from 10% at baseline, to 14% with visual inspection of performance feedback. These increases are slight considering that each interval is only 15 seconds. This means that data from Teacher A's environmental management differed around a minute of observational time. Yet there was a shift in level, and a change in trend line. The latency of these changes was within the first few data points of the intervention. Teacher A's IRD data shows some effects for performance feedback at decreasing teacher use of environment management. From baseline to phase two yielded an effect size of .61, [.17, -1] suggesting a moderate relationship between performance feedback and decreasing environmental management. A positive effect size here indicates that the intervention created the expected direction of change. However, the confidence interval includes zero, which suggests that this finding is not significant.

Teacher B's average observed percent of environment management at baseline was 12%. When provided with performance feedback, the average observed levels of environment management went up to 20%. Her data shows a shift in level, but no visible trend line. From baseline to phase two yielded an effect size of -.46, [-.74, -.01], suggesting that visual inspection of performance feedback had a moderate effect at increasing teacher use of environmental management.

Teacher C's data shows a small decrease in observed intervals of environmental management from baseline to fading. Her data shows a small shift in level and trend. Teacher C's average observed intervals of environment management varied from 15.1% at baseline to 14.6% with visual inspection of performance feedback. Adding performance feedback to baseline yielded an effect size of -.26, [-.64, .14] suggesting a small effect at increasing use of environment management. However, the confidence interval includes zero, which makes this finding impossible to interpret.

Data from all three teachers yielded a weighted IRD of -.11, with a 95% confidence interval of [-.39, .18] between baseline and performance feedback. The intervention may have had a small effect on increasing teacher use of environmental management. However, this confidence interval includes zero suggesting that this finding is not significant.

Behavior. All three teachers had consistently low rates of observed behavior correction throughout all phases of the study, as shown in Figure 4. IRD effect sizes were not calculated for behavior because too few intervals were observed when teachers were engaged in behavioral correction and meaningless changes in this behavior were observed between phases. Visual inspection reveals flat trend lines and minimal changes

in mean and level. Teacher A's average percent of intervals observed in behavior correction remained a constant 6% between baseline and phase two. Teacher B's average percent of intervals observed in behavior management started at 4% at baseline. When visual inspection of performance feedback was added, the average number of observed intervals went to 2% where it remained for the duration of the study. Teacher C's data actually showed no change in behavior correction as a result of phase two.

Observers also collected data on Behavior using a frequency count, as shown in Figure 6. Observers recorded positive and negative behavior corrections separately as a frequency count throughout the 30-minute observation. These results varied somewhat from the behavior management observed with momentary sampling.

Teacher A's data shows a decrease in both positive and negative behavior corrections following the intervention. During baseline, Teacher A made an average of 5.7 positive behavior corrections and 14.5 negative behavior corrections. With performance feedback, Teacher A made an average of 4.6 positive behavior corrections and 10.6 negative behavior corrections. There was also a shift in level and trend in phase two. IRD effect sizes for these data show small effects for decreasing behavior corrections as a result of the intervention. Adding visual inspection of performance feedback to baseline yielded an effect size of .33, [-.17, .78].

Teacher B's behavior data does not show much change over the course of the study. At baseline, she made an average of 6 positive behavior correction and 3.75 negative corrections. When performance feedback was added, both decreased to an average of 2.13 negative corrections and 2 positive corrections. There was also a shift in level and her trend line flattened in phase two. IRD effect sizes of the total frequency

count also show mixed effects. From baseline to performance feedback yielded an effect size of .71, [.38, 1] showing a strong effect for performance feedback at decreasing behavior corrections.

Teacher C's data shows a level shift and an upward trend for behavior corrections. At baseline, Teacher C made an average of 3.6 positive behavior corrections and 5.8 negative behavior corrections. With performance feedback, Teacher C made an average of 3.2 positive behavior corrections and 6.7 negative behavior corrections. IRD effect sizes show inconsistent effects. From baseline to performance feedback yielded an effect size of -.53, [-.85, -.23] which suggests a moderate relationship between performance feedback and increased levels of behavior correction.

Off-Task Teacher Behavior. Environment management, behavior management and time spent not teaching were combined to form a composite off-task teacher behavior score shown in Figure 6. Through increasing instructional time, off-task teacher behavior should decrease. Teacher A engaged in off-task teaching behaviors for 20% of the observed intervals at baseline. During phase two, this increased to 27%. There was also a level shift. At baseline, the trend was flat, but with the intervention the trend became positive. From baseline to phase two yielded an IRD effect size of -.72, [-1, -.33] indicating a strong relationship between adding visual inspection of performance feedback and increased off-task teaching behaviors.

Teacher B engaged in off-task teaching behaviors for 22% of the observed intervals at baseline. This increased to 37% of the observed intervals with visual inspection of performance feedback. There was a level shift, but it does not represent changes in the data. There is no clear trend line in phase two because of the variability of

the data. Adding visual inspection at baseline yielded an effect size of -.46, [-.83, -.04] indicating a moderate relationship between this phase change and increased levels of off-task teaching behavior.

Teacher C was engaged in off-task teaching behaviors for 29% of the observed intervals at baseline. This fell to 20% when performance feedback was provided. There was a level and trend shift. Adding performance feedback at baseline yielded an IRD effect size of .57, [.29, 86] suggesting a moderate relationship between performance feedback and decreased off-task teaching behaviors.

The Effects of Phase 3: Visual Inspection of Performance Feedback and Consultation on Teacher Behavior

It was hypothesized that consultation combined with visual inspection of the TOT would lead teachers to increase their instructional time significantly more than when they were able to visually inspect their data without face to face consultation. The null hypothesis states that there would be no change in teacher behavior as a result of seeing TOT data and taking part in consultation. Results show that teacher behavior did change, but it was not in the desired direction, with the exception of Teacher C.

Graphs generated from the multiple baseline design are shown in Figures 1-8. The graphs show variability in the data. The graphs for each teaching behavior will be discussed separately in terms of visual inspection, mean level differences, and improvement rate difference (IRD).

Teaching: Changes in teacher data following the addition of consultation were not consistent across teachers or behaviors, as shown in Figure 1. Adding consultation to the performance feedback lowered Teacher A's average number of intervals observed

Teaching to 32%. There was a mean and a level shift. The data is too variable to really see a trend. Small group instruction also went down to 3%. Whole group instruction also went down with consultation to 29% of the observed intervals. Teacher A's IRD effect size was -.65 [-1, -.29], suggesting a moderate negative relationship between consultation and time spent teaching.

For Teacher B, adding consultation did not change the average observed intervals teaching. There was a level shift, but her data was also too variable to view a trend. However, it did cause a shift in her small group and whole group teaching. Teacher B's average observed intervals of small group instruction dropped to 16%, which is below baseline. Teacher B's whole group instruction rose to 18%, which is still below baseline. Effect sizes between this phase and the previous one yielded confidence intervals that include zero, which makes interpretation difficult. Teacher B's IRD effect size was .20 [-.33, .71]. This small effect size suggests that adding consultation had a positive effect on teaching, however the confidence interval includes zero making this finding difficult to interpret.

Teacher C's data showed a slight increase in teaching behavior as a result of consultation. She taught for 78% of the intervals. This shows a mean and level shift. Additionally, her trend line continues to show a positive trend towards increased instructional time. Whole group instruction shifted by 1% of the intervals, while small group instruction increased 6% following the addition of consultation. When consultation was added, the IRD went down to .38 [-.12, .86], which illustrates a small effect at increasing teacher use of on-task teaching behavior. However, the confidence interval captures 0, meaning this finding is insignificant.

Feedback: When consultation was added, Teacher A's data shows an increase from 21% to 38% of the intervals observed providing feedback. There was a level shift as well. The latency of this change was immediate, but not sustained. The trend continued to be positive in this phase as well. Teacher A's improvement rate difference (IRD) data showed consultation having a positive contribution to use of feedback. The IRD rose to .53, [.07, .89], which suggested that consultation plus performance feedback contributed a moderate effect to increased use of feedback. With consultation, Teacher B's average observed intervals of feedback rose to 48%. There was also a level shift, but this change was not sustained. Likewise, the IRD rose to .59, [.18, 1], which suggested that consultation plus performance feedback contributed a moderate effect to increased use of feedback.

As described above, Teacher C did not use feedback in her teaching nearly as much as the other teachers. Results show her use of feedback decreased from 6% to 1% with consultation. There was a level shift, but it was small. Teacher C's IRD effect size for feedback was -.29 [-.69, .24], which shows a small negative relationship between consultation and decreased levels of feedback. However, the confidence interval includes zero.

On-Task Teaching: As described above, Teaching and Feedback were collapsed to create an on-task teaching behavior construct, shown in Figure 5. Teacher A's data shows a decrease from 73 to 70% of observed intervals in on-task teaching when consultation was added. There was a level shift as well. Her IRD effect size of -.18 [-.65, .29] shows a small effect for consultation at decreasing levels of on-task teaching observed. However, the confidence interval includes zero. Teacher B's data shows a dramatic increase in

observed levels of on-task teaching. She was on-task for 62% of the observed intervals in phase 2, while adding consultation in phase three led to on-task teaching during 86% of the intervals. There was a shift in level and a positive trend line. The level change was immediate and sustained. The IRD effect size of .46 [-.02, .88] suggests a moderate relationship between adding feedback and increased levels of on-task teaching, however it includes zero, which makes it difficult to interpret. Teacher C's data shows a slight decrease as a result of consultation. She used on-task teaching behavior for 80% of the observed intervals in phase two and 79% of the observed intervals when consultation was combined with performance feedback in phase three. There was a small shift in level. Her trend line also switches from positive to negative, suggesting a negative effect for adding consultation. However, after adding consultation, the IRD rose to -.24 [-.71, .26], which illustrates a small negative effect at increasing teacher use of on-task teaching. Again, the confidence interval captures zero, meaning this finding is insignificant

Environment: Teacher A increased her use of environment management from 14% to 18% of observed intervals when consultation was added. This shift in mean is largely because of one data point. Ignoring this data point, there was a shift in level and a decrease in use of environmental management. The IRD remained consistent with the previous phases at .64 [.26, -1]. Again, the confidence interval includes zero, which suggests that this finding is not significant. Teacher B's data showed a decrease in environmental management with consultation. The percent of observed intervals decreased from 20% to 10%. There was also a level shift, and some stabilization of the trend line. The IRD effect size was .20, [-.34, .71]. This shows a small effect for performance feedback and consultation decreasing observed teacher use of environmental

management, but the confidence interval includes zero, which suggests that this finding is not significant. Teacher C's data decreased from 12% to 10% of observed intervals with the addition of consultation. There was a level shift, but it was slight. After adding consultation, the IRD rose to .38, [-.12, .86] showing a small effect for decreasing teacher use of environment management. Again, the confidence interval included zero, so this finding is not significant.

Data from all three teachers yielded a weighted IRD of .42, [.09, .75] which illustrates a moderate effect at decreasing teacher use of environmental management when consultation and performance feedback were combined.

Behavior: The teachers did not spend much time correcting behavior during these observations. As described above, behavior data was collected in frequency count as well. Teacher A's behavior management went down slightly to 4% with consultation. When consultation was added, the frequency data fell to 4.5 positive corrections and 7.9 negative corrections. Likewise, the IRD rose to .42, [-.04, .78], suggesting a positive relationship between consultation and decreased rates of behavior management. However, the confidence interval included zero, so this finding is not significant.

Teacher B's behavior management data showed no change in phase three. Adding consultation resulted in an average of 8 positive corrections and 3 negative corrections. Adding consultation decreased the effect size to .31, [-.18, .88] indicating a small effect for consultation plus performance feedback at decreasing behavior corrections. However, the confidence interval includes zero, which makes it difficult to interpret this finding accurately.

After adding consultation, Teacher C's observed percent of intervals using behavior management rose to 8%. Teacher C made an average of 4.7 negative and 4.7 positive behavior corrections. The IRD fell to .31, [-.23, .86] which shows a small effect from consultation at reducing behavior corrections. However, the confidence interval includes zero making this difficult to interpret.

Off-Task Teacher Behavior: Environment management, behavior management and time spent not teaching were combined to form a composite off-task teacher behavior score. Teacher A's off-task teacher behavior increased from 27% to 30% of the intervals observed with consultation. There was a level shift in the expected direction, but the change was not maintained in the following data points. The variability in the range of data points also makes it difficult to view a trend line. After adding consultation, this fell to -.4, [-.78, -.33], suggesting a small effect for consultation increasing teacher off-task teaching behavior. Teacher B's data saw a decrease after adding consultation. Observed levels of off-task teaching fell from 37% to 14% of the intervals. There was a shift in level and a flattening of the trend line. The IRD effect size of .46, [.05, .88] suggests a moderate relationship with consultation and decreasing off-task teaching behavior. Teacher C's data shows a slight change with the average percent of intervals engaged in off-task teaching rising from 20% to 21%. There was a level shift and the trend line is positive suggesting an increase in use of off-task teacher behavior. The IRD effect size of .40, [-.07, .86] shows a moderate relationship between adding consultation and decreased levels of off-task teaching, however the confidence interval includes zero.

The effects of Phase 4: The effects of fading consultation on teacher behavior

It was hypothesized that changes in teacher behavior would be sustained once consultation ended. Phase 4 was a return to Phase 2 since teachers still received their performance feedback. Graphs generated from the multiple baseline design are shown in Figures 1-8. The graphs show variability in the data. By the end of the study, all teachers made changes in their instructional time, but Teacher A and B did not increase their instructional time as a result of this intervention. The graphs for each behavior will be discussed separately in terms of visual inspection, mean level differences, and improvement rate difference (IRD).

Teaching: For the final phase, the researcher removed consultation but delivery of daily performance feedback via e-mail continued. Results show that teaching behaviors changed in this final phase. For Teacher A, removal of consultation led to observed level of intervals teaching rising from 32% to 43%. There was a level shift that occurred right when the phase changed. The trend is negative when it was hypothesized that it would be positive. During small group instruction, the average went up from 3% to 11%. The IRD effect size, .21 [-.25, .88], shows a small relationship between fading consultation and increased levels of teaching. However, the confidence interval includes zero.

Teacher B's data also showed an increase in teaching. The average observed intervals teaching for Teacher B went up from 37% to 49% of the intervals. There was a level shift that occurred right when the phase changed. The trend is negative when it was hypothesized that it would be positive. Likewise when consultation was faded the average percent of intervals observed in small group instruction rose from 16% to 30%. Her IRD effect size of .38 [-.27, .80] shows a small positive effect for increased teaching and the fading of consultation, however, the confidence interval includes zero.

Teacher C's data showed a similar trend. Teacher C taught for an average of 78% of the observed intervals with consultation and 84% of the intervals following removal of consultation in phase three. There was a level shift that occurred right when the phase changed. The trend is positive which is in the desired direction. Her IRD effect size of .05 [-.57, .67] does not show a relationship between this phase change and the observed behavior.

Feedback: During fading, Teacher A's data went down a small amount from 38% to 32% intervals on average observed engaged in feedback. There was a significant level shift right as the phase changed. The trend line is also negative, suggesting a decrease in observed use of feedback. The IRD effect size of -.50 [-.88, -.12] shows a moderate relationship between removing consultation and decreased use of feedback. Teacher B's data also shows a strong left shift, but her trend line is positive. After fading consultation, her results went down from 48% to 37% of the intervals observed in feedback. Her IRD effect size of -.57 [-.86, -.39] indicates a moderate relationship between fading consultation and decreased use of feedback. Teacher C never used much feedback in her teaching, but her average number of intervals observed giving feedback was 0 at fading. The IRD effect size was -.25 [-.61, .39], which suggests a small relationship between fading consultation and decreasing use of feedback, however, this confidence interval includes zero.

On-Task Teaching: All three teachers saw an increase or maintenance in their levels of on-task teaching when consultation was faded. Observations show Teacher A engaged in on-task behaviors for 75% of the intervals. This increased from 70% of the observed intervals. There was an immediate shift in level, but there was also a strong

negative trend line. The IRD effect size of -.75 [-1, -.38] indicates a strong relationship between removing consultation and decreased use of on-task teaching. Teacher B's mean levels observed did not change in phase 4, however there was a level shift and a positive trend. The IRD effect size was .52 [-.14, 1], which suggests a moderate relationship between removing consultation and increased use of teaching, however, the confidence interval includes zero. After removing consultation, Teacher C was engaged in on-task teaching for 84% of the observed intervals. There was a level shift immediately and a positive trend toward increased use of on-task teaching. The IRD effect size was .21, [-.24, .63], which shows a small effect on increasing teacher use of teaching, but the confidence interval includes zero, which suggests that this finding is not significant.

Environment: All three teachers decreased their use of environmental management during phase four after the researcher stopped providing consultation. Teacher A's level of observed intervals managing environment fell from 18% to 15%. The level shift shows an immediate increase, but there is a negative trend line. The range of data points contributed to an IRD effect size of -.21, [-.88, -.25], which shows a small effect for phase four leading to an increase in teacher use of environmental management strategies. Teacher B's data shows the average observed percent of intervals of environmental management decreased from 10% to 5%. There was an immediate level shift and a negative slope. The effect size rose to .52, [-.10, .10] indicating a moderate relationship between removing consultation and decreasing environment management. Again, the confidence interval includes zero, which suggests that this finding is not significant. Teacher C's data fell from 10% to 8% of observed intervals in environmental management. There was a slight level shift and a negative trend line. Removing

consultation led to an increased effect size of .52, [-.14, 1], which suggests a moderate relationship between fading and increased environment management. However, it cannot be interpreted because the confidence interval includes zero.

Behavior: As described above, observed behavior rates for all three teachers were very low throughout all phases. Surprisingly, Teacher A's data shows an increase of 1% following the removal of consultation. She corrected behavior for 5% of the observed intervals. The frequency data shows less change for this phase. Without consultation, Teacher A made 4.3 positive behavior corrections and 5.7 negative behavior corrections on average. Teacher B maintained her 2% rate of behavior correction. However, her frequency data shows an increase in behavior corrections. Teacher B made 2.67 positive behavior corrections and 4.33 negative corrections during this phase. Teacher C's data shows observed percent of intervals in behavior correction falling to 6%. After removing consultation, Teacher C's had an average of 6 positive behavior corrections and 8.7 negative behavior corrections.

Combined the frequency data from the three teachers yielded an effect size of -.28 [-.72, .16] for phase four. This indicates a small negative relationship with removing consultation and increasing behavior management when observed as a frequency count. However, this confidence interval includes zero, so this finding cannot be interpreted.

Off-Task Teaching: Environment management, behavior management and time spent not teaching were combined to form a composite off-task teacher behavior score. When consultation was removed, Teacher A's observed percent of intervals engaged in off-task teaching fell to 25%, but this is still higher than her phase three level of 30%. While there was a level shift, the trend is positive suggesting that off-task teaching was

actually increasing. After removing consultation, the effect size rose to .88, [.62, 1] suggesting a strong relationship between removing consultation and decreasing off-task teaching behavior. Teacher B's maintained her level of off-task teaching at 14%, which is significantly lower than her baseline level of 22%. There was a level shift in the desired direction and a negative trend line. The effect size was .71 [.43, 1], which shows a strong relationship between removing consultation and decreasing off-task teaching behavior. After removing consultation, Teacher C was engaged in off-task behaviors for 16% of the observed intervals. This is much lower than her phase three level of 21%. There was a level shift in the desired direction and a negative trend line. This phase change yielded an effect size of .24, [-.43, .86], which suggests a small relationship between removing consultation and decreasing off-task teaching. However, this confidence interval includes zero, so this finding cannot be interpreted.

Instructional time in relation to student behavior

Off-task student behavior and teacher behavior

It was hypothesized that an increase in student off-task behavior, as observed with the BOSS, would be observed when the teacher engaged in behavior management, environment management, feedback or not teaching, as observed with the TOT. The null hypothesis states that there would be no difference in student behavior, as observed with the BOSS, as a result of the type of teacher behavior being observed with the TOT. Results did not show significant effects for the effect of teacher behavior on student behavior.

Results were calculated through comparing proportions of instructional time in minutes and amount of off-task student behavior in minutes as observed with the BOSS

and averaging across teachers. This yielded a two by two table. Individual teacher data, as well as student level data, from the BOSS are shown in Appendix D. Student data are shown on Figure 7 and Figure 8. Results showed that student behavior did change throughout the course of the study as a result of teacher behavior. On average across all phases, when teachers were teaching there was a 24% chance that students were off-task. However, there was a 25% chance students were off-task when the teacher was not teaching. On average across all phases, when teachers were giving feedback there was a 22% chance that students were off-task. However, there was a 25% chance students were off-task when the teacher was not providing feedback. Similarly, when teachers were managing the environment students were off-task for 30% of the observed intervals on average. However, there was a 25% chance students were off-task when the teacher was not managing environment. When teachers were managing classroom behavior, there was a 22% chance that students were off-task. However, there was a 25% chance students were off-task when the teacher was not managing behavior. These findings suggest that students were off-task more frequently when the teachers were engaged in environmental management. For this sample, results show that student off-task behavior did not change significantly as a result of teaching behaviors.

On-task student behavior and teacher behavior

The next question examined whether increases in instructional time, as observed with the TOT, translate to student outcomes such as increases in on-task behavior and decreases in off-task behaviors, as observed by the BOSS. It was hypothesized that an increase in instructional time as observed with the TOT would lead to an increase in on-task student behavior as observed with the BOSS. The null hypothesis states that there

would be no difference in on-task behavior as a result of the amount of instructional behavior being observed with the TOT. Results did not show consistent increases in instructional time. This question was answered by looking at the data across all phases of the study, because the goal was to increase instructional time over the course of the study.

Results were calculated through comparing proportions of instructional time in minutes and amount of on-task student behavior in minutes as observed with the BOSS and averaging across teachers. This yielded a two by two table. Individual teacher data are shown in Figures 1-6 and student data are shown in Figures 7 and 8. On average across all phases, when teachers were teaching there was a 76% chance that students were on-task. There was a 71% chance that students were still on-task when the teacher was not teaching. When teachers were providing feedback, there was a 53% chance that students were on-task. There was a 74% chance that students were still on-task when the teacher wasn't providing feedback. When teachers were managing the environment, students were on task for 70% of the observed intervals. There was a 75% chance that students were still on-task when the teacher wasn't managing the environment. While the teacher was managing behavior, there was a 71% chance that students were on-task. There was a 74% chance that students were still on-task when the teacher wasn't managing the behavior. Results showed that student on-task behavior did differ depending on teaching behaviors, but there was no significant difference between student behavior depending on whether the teacher was engaged in the behavior or not. There we must accept the null hypothesis. These results will be explained further in the discussion section.

While teachers were teaching, students were often on-task. A Sign-test was conducted in order to evaluate whether the differences in student behavior as a result of teacher behavior were significant. This test was chosen because proportions are on an ordinal scale, so a non-parametric procedure must be used. The Sign-test utilizes a z statistic yielding an effect size that can be interpreted as the proportion of observation periods when students were more likely to be on task when teachers were teaching than when teachers were not teaching. In the Teacher A's classroom students were on task 80.8% more under the teaching condition than the no teaching condition, ($z = 2.94$, $p = .003$). This shows a significant difference between teaching and not teaching for student behavior. In Teacher B's classroom there was no observed difference, ($z = 1.37$, $p = .17$). In Teacher C's classroom, students were on task 78% more under the teaching condition than the no teaching condition, ($z = -2.97$, $p = .003$). There was a significant difference in student behavior for the teaching conditions.

Social validity of the Time on Teaching (TOT)

It was hypothesized that data from the TOT would yield data that were useful in consultation and performance feedback, as rated by teachers on a survey. All three teachers were given the survey shown in Appendix B after the final observation. All teachers described the performance feedback data as useful. Teacher A reported that the most helpful data she received was student level of engagement and the division of how she spent her time teaching. Teacher B also reported that the student data and teacher data were helpful. She found it especially helpful to compare the two. Teacher C found the teacher data more helpful because she felt she already had a sense of student levels of engagement. In response to whether the teachers found consultation helpful, Teacher A

said “yes”. Teacher B elaborated more in her answer with, “Sort of”. She went on to say that she found looking at the data with someone helpful, but would have appreciated more suggestions on how to change the data. Teacher C wrote, “It’s always good to sit down, reflect upon and talk about one’s teaching – an opportunity that is very rare.” These results suggest that the TOT is a socially valid means for providing performance feedback in consultation.

It was also hypothesized that data from the TOT would yield data that is useful in making changes in how a classroom functions. The quality rating on the TOT ranged from 1-10, with 1 representing poor teaching and 10 denoting excellent teaching. Teacher A’s average teacher quality rating ranged from 3-9 throughout the study. The average quality rating was 6.7 and the mode was 6. The quality rating did not change significantly or in the expected direction as a result of this study. Teacher B’s average teacher quality rating ranged from 6-9. The average quality rating was 7.28 with a mode of 8. The average quality rating remained fairly consistent throughout the various phases of the study. Teacher C’s quality ratings ranged from 6-9. Teacher C’s average quality rating was 7.6, with a mode of 8. Teacher C’s quality ratings improved slightly as the study progressed.

Responses on the teacher survey to question 4, “Do you see changes in your classroom as a result of this study?” show a range of experiences. Teacher A wrote that she isn’t sure if she sees changes yet, but she has begun to see changes in her thinking. Teacher B wrote that she is using her students more for environment management and accepting that she needs time to, “stare, watch, find a marker, go to the bathroom, talk with adults and so on”. Teacher C wrote that she is more aware of making every minute

count and managing the classroom environment more effectively. The changes teachers report are more in their thinking then in how their classroom functions. This of course, cannot be measured with the TOT.

CHAPTER 5:

DISCUSSION

This study was designed to increase the use of instructional time as a function of performance feedback with teachers about their use of time and their students' behavior. Teachers are inundated with demands for their teaching time. A common complaint from educators is that there isn't enough time to get everything done within the school day. However, research (Wang, 1985) has shown that teachers may be able to use their time more effectively. In order to better use every minute of instruction, teachers require support and feedback about their current practices. Previous research (Codding & Smyth, 2008; Cossairt et al., 1973; Leach & Conto, 1999; Reinke et al., 2008) used direct observation coupled with performance feedback to facilitate changes in teacher behavior that directly affect time use and student engagement. Wilczenski et al. (1987) found that teachers changed their behavior after seeing graphs depicting their students' behavior and receiving encouragement to develop their own strategies. Performance feedback has been demonstrated to be an effective follow up strategy for consultation to improve treatment integrity (Codding et al., 2008; Duhon et al., 2009; Mortenson & Witt, 1997; Noell et al., 2005).

This study aimed to extend previous research through using graphic performance feedback showing both teacher and student behavior to increase the amount of time engaged in teaching during allocated instructional times. In the following sections, each research area will be reviewed and results will be interpreted in light of past research.

Changing teacher behavior

One goal of this study was to increase instructional time by showing teachers how

they used their time. Data from observations using the TOT and the modified form of the BOSS were shared as performance feedback. Following baseline, teachers visually inspected their performance feedback. In the following phase, teachers continued to receive data on their own teaching behaviors and their students' engagement with the addition of weekly consultation. In the last phase, consultation was removed while teachers continued to receive their data for visual inspection. Results across the multiple baseline design showed varied effects of visual inspection of performance feedback and consultation. Overall percentages of observed intervals for each behavior do show some changes as a result of performance feedback, but the IRD effect sizes were largely insignificant. Also, often effects of the performance feedback phases were not in the direction that the researcher hypothesized.

Teacher A's observed intervals teaching decreased through the course of the study. At baseline she taught for 66% of the intervals, but this fell to 43% of the observed intervals at phase four. These minutes of instruction were allocated to feedback and environmental management, which Teacher A saw as an instructional priority. At baseline, the researcher observed her engaged in feedback for 15% of the intervals. This increased to 32% of the observed intervals by phase four.

Teacher B's observed intervals teaching remained relatively consistent throughout the study. At baseline, the researcher observed her teaching for 51% of the intervals, and this fell to 49% at phase 4. Teacher B only taught for half the observations. The remaining minutes were devoted to feedback and environmental management. She decreased her use of environmental management throughout the study to 5% of the observed intervals. Whereas, her use of feedback increased from 27% of the intervals at

baseline to 37% at phase four. Similar to Teacher A, this teacher saw feedback as an important part of her instructional practice.

Teacher C's data followed the trajectory that was hypothesized. At baseline, she taught for 61% of the observed intervals, but by phase four this increased to 84%. Teacher C's time spent managing environment and time not teaching decreased as her teaching time increased.

Overall, results did show teaching behavior changing as a result of performance feedback, but it was not in the expected direction. One explanation for the trends observed in this study may be how the teachers prioritize teaching activities. Teaching, as defined by the Time on Teaching, "is observed when the teacher is engaged in a teacher-led dialogue that is designed to impart knowledge and learning. Teaching is observed when the classroom teacher is facilitating learning, not when students are practicing what they have learned. Teaching is observed when the classroom teacher is engaged in teacher-directed instruction and teacher-facilitated instructional dialogue" (The TOT Manual). However, the three teachers in this study approached teaching with varying definitions. This disparity became apparent during consultation meetings where teachers described enthusiastically that they were spending the majority of their time engaged in feedback. This was not the desired outcome, since feedback is not a direct way of instructing students. Instead, feedback is a means for correcting work that a student has completed independently. Additionally, teachers engaging in feedback only interact with one student at a time, where the remainder of the students are not engaged in teacher-directed instructional activities. When teachers spend the majority of their time giving feedback, they spend a limited amount of time on direct instruction.

Another reason why performance feedback did not yield dramatic changes in teaching behaviors might lie in the high levels of teaching time already observed in this sample. All three teachers were spending close to half their observed time engaged in teaching at baseline. This was not expected based on previous research (Gettinger & Ball, 2008; Wang, 1985). Additionally, these teachers were spending approximately six intervals an observation managing behavior. This works out to about a minute and a half. This suggests a ceiling effect, meaning that because the teachers were already using their time effectively, little change could occur as a result of this intervention. Part of the reason behavior management was consistently low can be attributed to the extra adult supervision provided in the classrooms by paraprofessionals and student teachers. For example, during reading instruction in Teacher C's classroom of 16 students, she was able to take a small group of students while four other adults took small groups. All students received individualized targeted instruction for the entire reading period. This small group setting allowed for minimal behavior issues and provided for high levels of student engagement. The other teachers also had 1-3 paraprofessionals or student teachers in their classrooms assisting with student behavior and facilitating instruction.

As described above, researchers have used direct observation in research (Codding & Smyth, 2008) to generate data for performance feedback, which is then shared with teachers to facilitate behavior change. Previous studies did see teacher behavior change as a result of their performance feedback (Codding & Smyth, 2008; Reinke et al., 2008). Perhaps increasing instructional time is too broad of a concept to be changed with performance feedback in a relatively short study. Several studies attempted to increase academic engaged time (Cossairt et al., 1973; Leach & Conto, 1999; Wilczenski et al.,

1987) with performance feedback. Results from these studies showed that performance feedback could improve on-task student behavior. One reason this study had such different results than these studies might be related to the type of behavior targeted for change. The previously mentioned studies (Cossairt et al., 1973; Leach & Conto, 1999; Wilczenski et al., 1987) educated teachers in new strategies, but their target for behavior change was the student. They did observe changes in the teachers' behavior as well, but ultimately the student outcome were seen as paramount. In this study, the student level observations did not show much behavior change throughout the study. The focus for consultation was teacher behavior, and student behavior was secondary.

Another explanation for the inconsistent findings could be that the researcher observed teaching behavior using the TOT, which is a relatively untested measure. Inter-observer agreement varied by type of teaching behavior observed. Agreement for Teaching was 82%, for Feedback 66%, for Environment 50%, for Behavior 57% and for No Teaching agreement was 50%. Teaching was the most frequent behavior, and the easiest one to code. The other behaviors were not coded with a high enough level of agreement. Based on the limited data collected using the TOT, and the inconsistent inter-observer agreement, it is difficult to conclude whether or not these interventions were effective, or if unreliability of the measure threatens the validity of these results.

Previous research (Scheeler et al., 2004) shows that performance feedback coupled with consultation is an effective strategy for changing teacher behavior. The consultation used in this study included elements of Motivational Interviewing (Miller & Rollnick, 2002), such as collaboratively developing a menu of options, setting goals and using praise. While MI is seen as a well-researched treatment for addiction, it is in its infancy

for use in the schools (Blom-Hoffman & Rose, 2007). In two recent studies in the schools, Gueldner and Merrell (2011) and Reinke et al. (2008) used MI and performance feedback together. Their results showed that teachers were receptive to this intervention, and their results showed changes in the desired behaviors as well. However, this study used a similar combination of MI and performance feedback, yet the results did not show consistent changes as a result of the intervention. One explanation for this might be the length of the study and the conflicting goals of the researcher and the teacher around defining effective instruction. As described above, the goal for increasing instructional time led to mixed results because two of the teachers defined their teaching through use of feedback.

The effect of teacher behavior on student behavior

A second aim of this study was to establish a functional relationship between teacher behavior and student behavior. Following analysis of on-task teaching with student behavior, proportions were computed and then compared. On average across all phases, when teachers were teaching there was a 76% chance that students were on-task. When teachers were providing feedback, there was a 53% chance that students were on-task. When teachers were managing the environment, students were on task for 70% of the observed intervals. While the teacher was managing behavior, there was a 71% chance that students were on-task. Students were most likely to be on-task when the teacher was teaching, but managing environment was not far behind.

The other side of these results shows that students were on-task for the majority of the observations. Student off-task behavior was consistently low, which suggests high levels of student engagement. Over the course of the study, students in Teacher A's were

on task for an average of 72% of the observed intervals, and off-task for an average of 28% of the intervals. Teacher B's students were observed on-task for an average of 81% of the intervals across the phases and off-task for 19% of the intervals. Similarly, Teacher C's students were observed on-task across the phases an average of 85% of the intervals and off-task for 15% of the intervals.

Results showed that when teachers were teaching, there was a 76% chance that students were on-task, but when the teacher wasn't teaching there was still a 75% chance that students were on-task. Students were on-task for the majority of the observed intervals, which means their behavior was often independent of the teacher. Of course, this finding might be reflective of the measure of student behavior rather than what was actually taking place in the classroom. Further research is needed on the observable effects of various teacher behaviors on student engagement.

As described above, students were off-task for a very small percentage of observed intervals. On average across all phases, when teachers were teaching there was a 24% chance that students were off-task. When teachers were giving feedback, there was a 22% chance that students were off-task. Similarly, when teachers were managing the environment, students were off-task for 30% of the observed intervals on average. Lastly, when teachers were managing classroom behavior, there was a 22% chance that students were off-task. Significance Testing using the Sign test revealed that Teacher A's and Teacher C's classrooms had a significant difference in student behaviors between teaching and no teaching conditions. In Teacher A's classroom, students were on task 80.8% more under the teaching condition than the no teaching condition. In Teacher B's classroom there was no significant difference. In Teacher C's classroom students were on

task 78% more under the teaching condition than the no teaching condition.

Wilczenski et al. (1987) found that teachers changed their behavior in response to seeing student behaviors graphed as on and off-task. Teachers in this study also received graphs depicting their students' behavior. Student off-task behavior was consistently low, which suggests high levels of student engagement. One explanation for this could be that the teachers who volunteered for this study have strong classroom management skills, or use their paraprofessionals effectively.

Another more likely reason for these data could be that the modified BOSS was not a valid measure of student behavior for purposes in this study. Observing students by observing a different student in the classroom at each interval was challenging because students frequently moved around the room or left for the bathroom or pull out services. While this movement is typical within an elementary school classroom, it led to some students being over or under represented in data collection. Unfortunately, scheduling trained observers for this instrument was challenging so only 15% of the observations included an additional observer. Observers using the modified form of the BOSS agreed 91% of the intervals on whether the student was on-task. Agreement for off-task behavior was 73%. The on-task behavior reliability might be higher than the off-task data because students were on-task for more of the intervals observed and deciding whether a student is on task might be an easier decision for the observer. While reliability was relatively high for this modified form of the BOSS, it remains unclear whether this measure was actually capturing the classroom behaviors. All three teachers were pleased with the high levels of student engagement because as one teacher explained, she is distracted by the off-task student behavior, which prevents her from seeing all of the good things

happening in her classroom.

The social validity of the TOT

The final goal of this study was to assess the social validity of the TOT as a consultative tool. Previous research (Easton & Erchul, 2011; Scheeler et al., 2004; Simonsen et al., 2010) demonstrated that teachers want feedback about their practice. Additionally, Easton and Erchul (2011) and Simonsen et al. (2010) found that teachers have preferences about the format of the feedback, and how it is received. Surveyed teachers preferred weekly feedback via e-mail through the school psychologist. Based on this research, it was expected that the teachers in this study would find the procedures acceptable. Results showed that teachers enjoyed receiving performance feedback. Two of the teachers found the student level data helpful, while the third preferred the teacher data alone. One teacher commented that she needed more time to really make the changes in her teaching that she wanted to make based on her data. Another teacher requested that further studies using the TOT be conducted in her classroom so that she would have more access to this type of data about her own practice. These findings suggest that the TOT may be a useful tool in teacher consultation. Additionally, providing teachers with performance feedback in this manner was acceptable to teachers.

Limitations

Several threats to validity in this study require further discussion. The results from this study are vulnerable to selection bias. Three teachers volunteered for this study with similar teaching histories. All had taught for at least twenty years, with the majority of their teaching being in the same district. Additionally, a selection threat also exists for the classrooms. The classrooms being observed all had at least one other adult in the room.

Two of the classrooms always had 2-3 paraprofessionals. This meant that students were occupied with adult attention even while the teacher was managing student behavior, managing the environment or not teaching. When the teacher was not teaching or focused on the students, there would be little effect on the majority of the students since other adults were monitoring their behavior. These classrooms were intentionally set up to work in this way. These classrooms also had relatively few students for a public school classroom. The number of students ranged from 16 to 18. These teachers and their small classrooms with abundant support are not representative of a typical elementary school classroom.

Testing and instrumentation are also threats to the internal validity of this study. Observer reactivity was a concern when planning this study. For the most part, teachers knew ahead of time when the observers would be in their classrooms. All three of the teachers said they did not need advance notice, but it was provided in case the teacher had a sick day or an assembly during a scheduled observation. In effect, the teachers were notified of observations in order to protect observation time. Codding et al. (2008) used a two-way mirror to test observer reactivity and performance feedback. Their results showed that the teachers were not affected by the observers' presence. Most teachers are accustomed to frequent observations, so that a few extra people observing becomes inconsequential to their practice.

Instrumentation is an issue because this study used a measure that is relatively untested so it cannot be determined whether enough observational data was collected to create meaningful conclusions. Codding and Smyth (2008) also used an untested measure, but their data collection included videotaping of lessons that were then

reviewed and coded. Observers coded on-task student behaviors and whether the teacher was instructing or transitioning students. The TOT has more variables involved and the observing live in the classroom can be more challenging. Unfortunately, the low levels of inter observer reliability make it difficult to assess whether the observations are accurate. The TOT has demonstrated high levels of IOA in past research (Solomon et al., 2011). The BOSS also has high levels of IOA when used as designed (Shapiro, 1996). However, the BOSS was modified for this study in a manner that is not demonstrated in research. Due to scheduling difficulties with observers, it was difficult to get enough observations using the modified BOSS with a second observer. This measure used to capture class-wide data was also challenging to conduct because students in elementary school classrooms frequently move around the room for academic and non-academic tasks. Future research should examine the validity of observing class wide student behavior using a rotating observation schedule, as well as increasing the inter observer reliability.

Analysis of the research findings relied heavily on visual inspection and the IRD effect size. Visual inspection can be helpful when intervention effects are strong, but less so when the criteria for success is unknown or the effects are slight (Kazdin, 1982). In this study, data were variable and the effects were not obvious, or in the intended direction for some phase changes. Visual inspection proved less useful in determining results. The overall percentage of intervals observed in various teaching behaviors was calculated and then compared by phase. This was done in order to account for the range of data points in each phase. The IRD effect size was calculated to further understand the effects of this study. Parker and Vannest (2009) cite six reasons for using the IRD: it directly relates to visual inspection, IRD can be interpreted easily using known

benchmarks, hand calculation, it is established in the research, it does not require parametric assumptions and confidence intervals can be calculated. Results showed largely insignificant effect sizes. This is likely due to the variable nature of the data. One day a teacher might have spent the majority of her time teaching, but the next day something changed and she managed the environment for most of the time. This visible range of data points is evident on the time series graphs. The IRD was effective at capturing the spread of the data. A consistent improvement from phase changes would be shown in these effect sizes if it existed.

Power is a concern for this study as well. In a single subject design, power is determined based on the number of data points rather than the number of subjects (Parker, Vannest & Davis, 2011). The length of this study was determined based on examples from the research (Codding et al, 2008; Codding & Smyth, 2008; Reinke et al., 2008). Perhaps the data would have shown more changes if the study had continued longer into the school year.

Results from this study have limited generalizability because of the unique characteristics of the sample. All three teachers had over twenty years of teaching experience. Yet, these three veteran teachers volunteered for this study. They all are involved in multiple committees and take advantage of every professional development opportunity that appears. All three teachers had student teachers as well. Perhaps these teachers do not have much room to grow when it comes to increasing instructional time. Since there are no data on best practices for time spent teaching, it is difficult to ascertain what is enough to improve student achievement or what is enough to suggest effective teaching.

Future Research

Future research could integrate use of the TOT, or other performance feedback depicting teacher time as a consultation tool. The teachers in this study enjoyed seeing their data. Perhaps this method can be effective for working on specific skills in the classroom rather than working to increase instructional time. Additionally, it would be interesting to see if instructional time varies between classrooms as moderated by extra adults. As described above, the classrooms in this study contained student teachers, paraprofessionals and aides. This set up was not new for any of these teachers, so they taught with these extra hands in mind. One teacher explained that each week she handed out lesson plans to her paraprofessionals so that she could minimize discussions with them during teaching time and maximize their instructional time. Clearly this classroom would lead to very different data than a classroom with just one teacher. Various teacher characteristics such as years teaching, management style and philosophy would also affect the results. Additionally, classroom variables such as number of students, number of adults, age of students and structure of the lesson might lead to varying use of teaching time.

Many of the observations in this study took place during the same instructional period from one day to the next. This allowed for easier scheduling, but it also opened a new potential area for research. Teacher behaviors remained relatively consistent from one day to the next in a given subject area. It would be interesting to compare teacher time use in one curricular area across a larger span of time to see whether their time use changes through the school year. For example, Teacher A in this study taught writing through a brief mini-lesson followed by independent work. She gave feedback to students

on their independent work throughout the observation. Students went to their "writing spots" and mostly stayed on task. This type of environment must be set up and cultivated early in the year. Did Teacher B use more teaching and less feedback in the fall then the spring? Solomon et al. (2010) did show the TOT as sensitive to the gradual release of responsibility hypothesis, but it would be interesting to see if this could be extended to specific curricular areas.

It remains unclear whether there is an ideal percent of a class period that a teacher should be teaching. In an ideal world, the teacher should be spending the majority of her time on instruction, but this will look different in every classroom. For the most part, the students observed in this study were on-task even when their teacher wasn't, showing that student engagement may be independent of teacher behaviors. In a classroom of thirty students with one adult, both teaching and behavior management look different. Future research should explore student outcomes from various ratios of time-spent teaching. Perhaps the student outcomes will reveal more information about the percent of the day a teacher needs to spend teaching, as opposed to giving feedback or managing the environment.

Previous research has demonstrated the effectiveness of performance feedback at changing teacher behavior (Codding & Smyth, 2008; Reinke et al., 2008). This study did not show strong results for performance feedback improving the teachers' use of their instructional time, but future research with a more variable group of teachers with more typical classroom student-teacher ratios might show different results. Teachers want to use their time well, but they are not given the tools or the training to accurately measure their time use. Consultation coupled with observed driven performance feedback may

provide teachers with the necessary information to create meaningful changes in their effective use of every minute of instructional time.

APPENDIX A

CONSULTATION PROCEDURES

1. Review Teacher Data: What do you notice looking at your data? What did you spend the most time doing?

2. Praise statement 1:

3. Review Student Data: What do you notice looking at your students' data? What did they spend the most time doing?

4. Praise statement 2:

5. Review menu of options for things to try and select some to try this week

6. Praise statement 3:

7. Goals for your data, what would you like to see next week?

____ Steps completed

APPENDIX B

TEACHER SURVEY

1. **How do you define teaching?**

2. **What type of teaching (small group, whole class, individual) do you think leads to the most student learning, and why?**

3. **Did you find consultation to be helpful?**

2. Do you see changes in your classroom as a result of this study?

3. Do you feel you've gained instructional time?

4. Do the changes to how you use your time affect how much you can get done?

5. Please rate your level of satisfaction with this study in terms of helping you increase your instructional time

1	2	3	4	5
(not at all)	(somewhat)	(neutral)	(more time)	(sharp increase in time)

6. Other comments, suggestions or questions

APPENDIX C

RECRUITMENT LETTER

Date: October 15, 2010
To: K-3 Teachers at _____ school
From: Suzanne Klein, M.Ed.
Doctoral candidate
School Psychology Program
University of Massachusetts Amherst, MA 01003
Subject: Research on the demands on classroom teachers during allocated instructional time

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As educators, we are always seeking ways to make the best use of the limited amount of time we have in the school day. There are many demands on classroom teachers to accomplish things other than teaching within their allocated class time. As demands increase, the school day isn't any longer. Your teaching time is precious, and I want to help you allocate more of your time for teaching.

My dissertation is investigating the use of time allocated for instruction across a school day. To accomplish this, I am gathering observational data in schools throughout Western Massachusetts. If you agree to participate in this study, you can expect researchers to visit your class during the times you indicate as protected instruction. These researchers will place themselves inconspicuously in your classroom and will observe the time you spend teaching, managing your classroom environment and student behaviors. Additionally, they will observe the engagement of students in your classroom as it relates to the percent of time you are able to engage in teaching during this allocated instructional time.

Data from these observations will be periodically shared with you at your convenience. During these meetings you will get an opportunity to see how you use your instructional time despite the competing logistical demands within the school day. All data gathered during our observations will be private and not shared with anyone.

If at any point you would like to withdraw from participation in this study, you would be free to do so without any negative repercussions for you, your employer or your relationship with the University of Massachusetts, Amherst. If at any point you have questions about your participation or this study, please contact Suzanne Klein at (339) 222-1164 or saklein@educ.umass.edu.

I am seeking participants for my study. If after reading this, you'd like to hear more about participating in the study, please fill out the sheet below so we can set up a time to discuss this further.

Name: _____ Grade you teach: _____

Please include your email address and/or a phone number so we can set up a time to discuss this study further. Please indicate the best way we can reach you.
Phone Number : _____Best Way to Reach Me ❑

Email: _____ Best Way to Reach Me ❑

Thank you for your willingness to consider participating in this study!

These are the phases of the study:
First, I will be observing what happens typically in your classroom in terms of what competes for instructional time. Then I will be giving you data on what I've observed in your classroom. Next, we will be meeting at your convenience to look at the data and brainstorm ways to increase your instructional time. And that's it!

Observations:
We will observe your teaching during times that you report as protected for instruction. We are also observing student engagement. Data from these observations will be shared with you.

Meetings
During part of the study, I will meet with you briefly to show you your observation data and discuss it together.

Survey
At the end of the study, I will ask you to fill out a brief survey on how effective you felt this study was on increasing teaching time in your classroom.

_____

Name: _____ Grade you teach: _____
Gender: _____ Highest degree: _____ # yrs teaching: _____
Time of your school day: Start time: _____ Ending time: _____
Time allocated for lunch each day : _____
Time allocated for recess each day: _____
Time allocated for Specials: _____
(Out-of-classroom activities such as Art, Gym, and Music)
The time of your school day ***allocated for instruction*** (With your permission, we will use these times for your classroom observations.):
_____
_____
_____

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