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Jennifer Birchler
*University at Albany, State University of New York,* jbirchler@albany.edu

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UNDERSTANDING TEACHER BEHAVIOR AND ITS INFLUENCE ON STUDENT ON-

TASK BEHAVIOR

by

Jennifer L. Birchler

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ABSTRACT

Student behavior in the classroom is a significant predictor of student outcomes and teacher satisfaction. But, teachers report classroom management to be challenging. Finding simple, cost-effective methods of improving student behavior in the classroom can vastly improve long-term success for students. This study seeks to better understand how class size relates to teacher praise and movement, and how these teacher behaviors relate to student on-task behavior. Previous research suggests on-task behavior improves with more teacher praise and movement in the classroom. The current study used data collected using the Bx Management Tool as part of the Osage County Fall 2019 G-Study. Regression analyses were used to measure the relationship between class size and teacher praise and teacher movement, as well as to measure the relationship between each of these teacher behaviors and on-task behavior in students. Although not statistically significant, a positive relationship was found between class size and teacher movement, teacher praise and on-task behavior, and teacher movement and on-task behavior. A non-significant, negative relationship was found between class size and teacher praise. These findings are consistent with previous research; and although no findings were significant, they support the idea that simple, cost-effective behavior management strategies can improve outcomes for students and teachers. It is important that teachers are provided support in order to improve their use of these strategies in their classrooms.

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Introduction

Academic and social success in school is largely contingent on appropriate classroom behavior (Conroy et al., 2008; Gest & Gest, 2005; Jennings & Greenberg, 2009; Landrum et al., 2003; Reinke et al., 2011). Classroom behavior management is an important factor influencing learning (Wang et al., 1993). Addressing problem behavior is reported by teachers as one of the most difficult challenges they face in their jobs (Reinke et al., 2011). Effective behavior management contributes to positive classroom environments, which foster better social functioning and behavior in students (Frymier et al., 2019; Wilson et al., 2007). Inappropriate behaviors can interfere with a teacher's ability to deliver effective instruction (Reinke et al., 2011; Sugai & Horner, 2002). Teacher stress and burnout is more likely in classrooms where the teacher struggles with behavior management (Freiberg & Stein, 2003; Lewis, 1999; McKinney, et al., 2005).

Among the many classroom features that influence student behavior are teacher behavior and class size. Teacher behavior can be broken down into more specific behaviors, such as providing praise to students and teacher movement around the classroom (Anderman et al., 2011; Conroy et al., 2008; LeFebvre & Allen, 2014; Jenkins et al., 2015; Sutherland et al., 2008). Teachers' use of praise, their movement around the classroom, and class size have been identified as classroom features related to student on- and off-task behavior (Chalk & Bizo, 2004; Lewis & Sugai, 1999; Reinke, et al., 2018; Sutherland et al., 2000).

**Antecedent Strategies**

Effective classroom management prevents problem behavior from occurring and encourages rapid, effective responses to inappropriate behaviors that do occur. Antecedent strategies alter the events and environment prior to a problem behavior occurring (Kern &

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Clemens, 2007). They are typically low-cost, simple, and of low task demand (Kern & Clemens, 2007). Research suggests antecedent strategies can improve on-task behavior (Chalk & Bizo, 2004; Banks, 2014). Antecedent strategies can be applied at the classwide or individual level, depending on the needs of the class (Kern & Clemens, 2007). Despite their many benefits, antecedent strategies tend to be understudied and underutilized in classrooms (Cooper et al., 2007). Consequence-based strategies are more commonly used to address problem behaviors. Teacher praise and teacher movement are two antecedent strategies with research supporting their effectiveness for increasing on-task behavior in students (Anderman et al., 2011; Brophy, 1981; Chalk & Bizo, 2004; Kern & Clemens, 2007; LeFebvre & Allen, 2014). It is important to clarify that typically, teacher praise is considered a consequence-based strategy. However, it's potent ability to prevent/alter future antecedent-behavior-consequence relationships also renders it as an antecedent intervention.

**Applied Behavior Analysis**

Applied behavior analysis (ABA) is based on the theory that functions of human behavior can be understood and used within a therapeutic context to change and shape behavior (Cooper et al., 2007). Antecedents and consequences can be altered to change student behavior or its frequency; increasing and/or decreasing inappropriate student behavior. The effectiveness of ABA strategies in managing classroom behavior is well documented (Cooper et al., 2007; Wilder & Carr, 1998). Research suggests manipulating antecedent variables and applying appropriate consequences, which include the immediate reinforcement of target behavior, can quickly and substantially improve student behavior (Cooper et al., 2007).

**On-Task Behavior**

Disruptive and inattentive behaviors inhibit task engagement, and thus, learning (Sugai & Horner, 2002). On-task behavior includes behaviors such as demonstrating active listening, orienting towards the teacher or assigned task, following teacher directions, and seeking help appropriately when needed (Allday & Pakurar, 2007). On-task behavior is a valuable metric when evaluating the influence of classroom features on appropriate student behavior. On-task behavior in elementary students is positively correlated with academic outcomes (McClelland, et al., 2000). Off-task behavior is one of the most commonly cited reasons for referral to school support staff (Roberts, 2002). Increasing on-task behavior is important for improving academic, social, and behavioral outcomes in students.

**Praise**

Effective behavior management requires adequate amounts of praise for students. Praise is "favorable verbal or nonverbal attention directed toward a behavior or characteristic of the target" (Jenkins et al., 2015, p. 464). Research has found teachers provide more corrections than praise to students who exhibit challenging behaviors (Jack et al., 1996). Overall, research suggests teachers use praise infrequently and it is often noncontingent (Brophy, 1981; Owens et al., 2018). Noncontingent praise does not depend on the student engaging in any specific behavior, whereas contingent praise requires the student to engage in a particular behavior in order to earn praise (Conroy et al., 2008). That is, the praise is used as a reinforcer to increase that behavior's (e.g., doing seatwork independently) frequency in the future. Teacher praise has been shown to increase on-task behavior, particularly when the teacher specifies why the student is receiving the praise (Chalk & Bizo, 2004). That is, it is behavior specific praise. When teachers use behavior specific contingent praise and other antecedent and consequence strategies

to improve student behavior, they also contribute to an environment that promotes the academic achievement of their students (Freiberg et al., 2009).

**Teacher Movement**

Teacher movement around the classroom has also been identified as a likely feature of effective classroom management (Anderman et al., 2011; LeFebvre & Allen, 2014; Sutherland et al., 2008). It has been suggested that teachers who move around the classroom are better able to monitor student understanding (Evertson, 1989). It has also been suggested that when teachers are in close proximity to students it can reengage students who are off-task (Brophy, 1983; Conroy et al., 2004; Lewis & Sugai, 1999). Research suggests active supervision, including moving around the classroom while frequently scanning students' behavior, reduces classroom problem behaviors by allowing the teacher to detect a greater range of problem behaviors, and respond to them more quickly. (Colvin et al., 1997; DePry & Sugai, 2002). Anderman and colleagues (2011) suggest teacher movement around the classroom helps teachers build rapport, support students' academic growth, and manage classroom behavior.

**Class Size and Behavior**

Class size is a classroom feature that influences student behavior (Finn & Achilles, 1999; Finn et al., 2003; Glass & Smith, 1979; Mathis, 2017; Schanzenbach, 2014). Smaller classes allow teachers to spend more time on academic instruction and less time on managing behavior (Finn & Achilles, 1999; Finn et al., 2003). Smaller classes also give students more opportunities to participate and engage in class (Dee & West, 2011; Finn & Achilles, 1999; Finn et al., 2003). Research suggests students are more likely to be on-task, spend less time waiting for the next task, and have less down time when they are in a smaller class (Finn & Achilles, 1999; Finn et al., 2003; Schanzenbach, 2014). Academic achievement is negatively correlated with class size

(Coleman et al., 1966; Glass & Smith, 1979; Jepsen & Rivkin, 2009). In addition to improving student outcomes, evidence suggests teacher satisfaction is higher in teachers of smaller classes (Finn et al., 2003; Graue & Rauscher, 2009).

**Research Questions and Hypotheses**

This study seeks to extend current research on ratios of praise to corrections, teacher movement, and class sizes as they relate to increasing on-task behavior in students by replicating prior findings and investigating relationships amongst a highly rural sample. The following research questions were addressed:

(a) Does class size influence the amount of praise given by teachers?

(b) Does class size influence teacher movement around the classroom?

(c) Does the frequency of praise given to students by teachers influence student on-task behavior?

(d) Does teacher movement around the classroom influence student on-task behavior?

It was hypothesized that the answers to questions (a) and (c) would parallel the findings of previous studies, with larger class sizes being associated with reductions in praise given and increases in praise being associated with more on-task behavior. It was also hypothesized that there would be less teacher movement in larger classes and that more teacher movement would be associated with more on-task behavior in students.

<p align="center">Review of the Literature</p>

**Behavior Management**

Academic and social success for children is predicted by the acquisition and use of appropriate behavior in the classroom (Conroy et al., 2008; Jennings & Greenberg, 2009; Reinke, et al., 2011). Appropriate behavior is defined as a student's attention being directed toward the task assigned by the teacher (Blaze, et al., 2014). A variety of classroom features, such as teacher behavior, influence student behavior in the classroom (Frymier et al., 2019). Disruptive behaviors reduce instructional time for the student engaging in the behavior and that student's peers (Reinke et al., 2011; Sugai & Horner, 2002). It also interferes with the teacher's ability to deliver instruction (Reinke et al., 2011; Sugai & Horner, 2002).

Further, research suggests there is a strong relationship between behavior problems in school and low academic performance (Gest & Gest, 2005; Landrum, et al., 2003). For example, behavior problems in early elementary school are linked to later academic outcomes (McClelland, et al., 2000). Students who exhibit high levels of oppositional behavior in school are more likely to be involved with the criminal justice system, to drop out of school, to abuse substances, and to develop certain psychiatric disorders (DeLisi & Vaughn, 2014; Egger & Angold, 2006; Kellam et al., 2008). Researchers have suggested problem behaviors must be altered significantly by the end of the third grade in order to prevent lifelong problems for students (Stormont et al., 2007). It is also important to note that behavior problems and academic difficulties are reciprocal in nature (Payne, et al., 2007). For these reasons, it is pivotal that we identify classroom features that can be altered to improve student behavior and, therefore, long-term outcomes.

Problem behavior also influences teacher stress level (Freiberg & Stein, 2003; Lewis, 1999) and the educational strategies teachers use in the classroom (Cohen & Lotan, 2014; Freiberg, et al., 2009). Difficulty with classroom behavior management is associated with higher rates of teacher burnout (McKinney, et al., 2005). The direct and indirect effect of classroom behavior management on learning is important to consider when a student is struggling behaviorally or academically. Improving teacher satisfaction and efficacy are important reasons to investigate classroom features that improve student on-task behavior.

**Classroom features and student behavior.** There are many classroom features that influence student behavior. These include, but are not limited to, teacher behavior and class size. It is important to consider all aspects of a classroom when attempting to improve on-task behavior in students, and thus, improve student outcomes (Freiberg, et al., 2009; Wang, et al., 1993; Wilson, et al., 2007). There is a large body of research examining how teacher behavior and class size influence academic and behavioral outcomes for students. Teacher behavior has been broken down into many more specific behaviors, such as providing praise and moving around the classroom (Anderman et al., 2011; Conroy et al., 2008; LeFebvre & Allen, 2014; Jenkins et al., 2015; Sutherland et al., 2008). Teacher use of praise, teacher movement, and class size have been identified as classroom features that are related to student on and off-task behavior (Chalk & Bizo, 2004; Lewis & Sugai, 1999; Reinke, et al., 2018; Sutherland et al., 2000).

A meta-analysis conducted by Wang and colleagues (1993) identified classroom management as the most important factor influencing school learning. Wilson and colleagues (2007) studied the influence of classroom environment on student social competence and overall student functioning. They included 946 elementary students in 820 different classrooms. Their

results showed that positive classroom environments, whose definition includes effective behavior management, lead to better social functioning and behavior for students in those environments (Wilson et al., 2007). In 2009, Freiberg and colleagues published a study investigating the effects of a program focused on improving school and classroom climate and student behavior on academic performance. They found the students in schools implementing the program significantly outperformed the students in control schools in reading and math. They also showed greater growth in those areas than their peers in control schools (Freiberg et al., 2009). A longitudinal study conducted by Opuni (2006) investigating the same school program found that teachers reported having increased instructional time each day after implementing the program. These diverse and positive impacts of increasing effective classroom management emphasize the importance of proactively addressing student behavior problems.

Teachers frequently report behavior management as one of the most challenging aspects of teaching (Reinke et al., 2011). Teachers also report receiving inadequate training in classroom management (Freeman, et al., 2013). According to Oliver and Reschly (2010), only 26% of special education training programs include courses on classroom management. Additionally, in those courses, the content focused primarily on reactive strategies, instead of proactive strategies (Oliver & Reschly, 2010). Reactive strategies are interventions used after an unwanted behavior has already occurred, such as a time out (Oliver & Reschly, 2010). Preventive, or proactive, strategies are used prior to unwanted behaviors in order to prevent their occurrence (Oliver & Reschly, 2010). This includes antecedent interventions, such as teacher praise, as well as the physical structure of the classroom and classroom routines (Emmer & Stough, 2001; Kerr & Nelson, 2002; Lewis & Sugai, 1999; Oliver & Reschly, 2010). Antecedent interventions should be one aspect of behavior management that is considered when determining how to increase

student on-task behavior. In order to ensure success, teachers must be trained in effective classroom management so they can encourage and support appropriate, on-task behavior in their students.

**Applied Behavior Analysis**

Applied behavior analysis (ABA) stems from the scientific field of behaviorism, which is based on the idea that the functions of human behavior can be understood and used within a therapeutic context to change and shape behavior (Cooper, et al., 2007). Cooper and colleagues (2007) defined ABA as:

> *The science in which tactics derived from the principles of behavior are applied systematically to improve socially significant behavior and experimentation is used to identify the variables responsible for behavior change* (p. 20).

In ABA, the shaping of behavior over time can be understood using a three-term contingency framework. This framework includes an antecedent stimulus (A), followed by a behavior (B), immediately followed by a consequence (C; Albers & Greer, 1991; Cooper et al., 2007). The antecedent stimulus is the event or trigger that occurs immediately before the behavior. The behavior is the action of the student that is being targeted. Consequences are the events that occur immediately following the behavior. An example of an ABC chain that commonly occurs in classrooms is students are given independent work to do (antecedent), a child starts talking to peers (behavior), and the teacher then verbally reprimands the student (consequence). In this situation, the function of the child's behavior may have been task avoidance or acquiring social reinforcement. The consequence was either aversive, reducing the probability of the behavior occurring again, or was reinforcing (adult attention), thereby increasing the probability of the behavior occurring again the next time the antecedent occurs. Antecedent-behavior-consequence

correlations are an essential part of treatment planning (Cooper et al., 2007). Antecedents and consequences can be manipulated to alter the type, frequency, or intensity of a behavior. Effective classroom management requires school staff to increase appropriate student behavior and decrease inappropriate student behavior. This can be done using strategies based in ABA.

The effectiveness of using ABA principles in classroom behavior management is well documented (Cooper et al., 2007; Wilder & Carr, 1998). It has been demonstrated that interventions developed based on the principles of ABA can improve the behavior of children and adolescents of varying ages and ability statuses and in a variety of settings (Cooper et al., 2007; Kahng, et al., 2000; Richman, et al., 2015). Such techniques have been applied at all tiers of service to promote positive student behavior and comprise the most substantial body of empirical literature on remediating child skill deficits. Manipulating antecedent variables in conjunction with applying appropriate consequences can lead to quick and substantial behavior change (Cooper et al., 2007). Increasing praise provided to students engaging in appropriate behaviors and increasing teacher movement in the classroom are two antecedent strategies that could lead to positive behavior change in students, such as increasing on-task behavior.

**On- and off-task behavior.** Task engagement is necessary for learning to occur (Gill & Remedios, 2013). Disruptive and inattentive behaviors inhibit task engagement, and therefore learning, for students and their peers (Sugai & Horner, 2002). In the educational literature, on-task behavior is assumed to be an indicator of task engagement, and thus, on- and off-task behavior are measured as proxies for engagement (Gill & Remedios, 2013). Behavioral functioning, measured using this proxy, is correlated with academic outcomes among elementary students (McClelland, et al., 2000). For these reasons, on- and off-task behavior are important outcome variables in research on behavior management in schools. While researchers have

generally agreed on how to define off-task behavior, the operational definition of on-task behavior is context dependent (Gill & Remedios, 2013). A definition proposed by Allday and Pakurar (2007) for a typical elementary/middle school classroom activity is:

> *(a) actively listening to teacher instructions, defined as being oriented toward the teacher or task and responding verbally (e.g., asking questions about the instructions) or nonverbally (e.g., nodding); (b) following the teacher's instructions; (c) orienting appropriately toward the teacher or task; or (d) seeking help in the proper manner (e.g., raising hand)* (p.318)

Off-task behavior can be problematic for the student engaging in the behaviors, the student's peers, and the teacher. In a study conducted by Swoszowski and colleagues (2013), off-task behavior was defined as when, "the student failed to attend to teacher instruction or the assigned task" (p. 69). Off-task behaviors are one of the most frequently cited reasons for student referral to school support staff (Roberts, 2002). Early behavior problems in school put students at risk for dropout, adult behavior issues, and emotional and behavioral disorders (Egger & Angold, 2006). Reducing off-task behavior is important for improving academic, social, and behavioral outcomes.

**Antecedent Strategies.** Effective classroom management both prevents problem behaviors from occurring and allows for rapid, effective responses to problem behaviors that do occur. Antecedent strategies are methods of changing behavior based on contingency-independent events that occur prior to the behavior (Cooper et al., 2007). They serve a unique and valuable role in behavior management because they can prevent problem behaviors from occurring, while other forms of intervention are applied as a reaction to problem behavior (Banks, 2014; Kern & Clemens, 2007). Antecedent interventions are one feature of a well-

rounded behavior management plan. Banks (2014) noted antecedent techniques are the first component of effective classroom management. Effective use of antecedent strategies can improve on-task behavior in students and reduce disruptive and off-task behaviors (Chalk & Bizo, 2004; Banks, 2014). Teachers and other school staff should incorporate evidence-based antecedent strategies into their behavior management plans in order to increase on-task behavior in their students.

Antecedent interventions often require less effort from teachers, increasing their value as a preventative tool. They can be applied to decrease the rate of problem behavior, resulting in better outcomes for the target student and his or her peers (Banks, 2014; Kern & Clemens, 2007). Antecedent strategies can be used at the class wide level or the individual level, depending on the needs of the students, and address the needs of most students (Kern & Clemens, 2007). When a student does not respond to class wide efforts, a more individualized approach should be taken to increase the student's engagement in appropriate behaviors (Kern & Clemens, 2007). Educators should consider antecedent interventions when determining how to increase on-task behavior and decrease off-task behavior in students. In the ABA literature, antecedent interventions are a key component in classroom behavior management (Cooper et al., 2007). Antecedent interventions reduce the probability of problem behaviors occurring through proactive measures, making punitive consequential procedures less necessary (Kern, et al., 2002). Providing praise to students for appropriate behavior, although typically construed as a consequence strategy, also aims to prevent future problem behavior, and moving around the classroom to continuously monitor students proactively are two examples of antecedent strategies teachers can employ to improve student behavior. Using antecedent interventions as one feature of a well-rounded classroom management plan can significantly increase on-task behavior in students.

In addition to being effective, chosen interventions must be feasible for teachers to implement in the context of their classrooms. If they are not, they will not be implemented with fidelity, meaning they will not be implemented as expected or intended, if at all (Forman et al., 2013). Fortunately, antecedent interventions tend to be simple and of low task demand. It is important to understand these factors and consider them when developing interventions to address behavior in the classroom.

Despite the advantages of antecedent interventions, they are underutilized in practice and understudied (Cooper et al., 2007). Often, when addressing problem behaviors in classrooms, the focus is on shaping behavior through the control of consequences (e.g., rewards and punishments). Using consequence-based procedures in isolation, such as differential reinforcement of target behavior (strategically reinforcing target behavior) or extinction (strategically removing the reinforcement maintaining problem behavior) fails to capitalize on the many benefits of using antecedent strategies (e.g., establishing an environment that prevents the occurrence of the behavior entirely or at a lesser rate). Several studies, described in greater detail below, have demonstrated that easily implemented antecedent interventions can have large effects on student behavior (Kern & Clemens, 2007). Additional research shedding light on the effectiveness of specific antecedent interventions on a variety of student behaviors and populations would provide valuable information to school professionals.

**Praise.** A key aspect of effective behavior management is providing adequate amounts of praise to students. Praise is defined as "favorable verbal or nonverbal attention directed toward a behavior or characteristic of the target children" by Jenkins and colleagues (2015, p.464). Generally, research shows teacher use of praise is typically infrequent and noncontingent (Brophy, 1981; Owens et al., 2018). Noncontingent praise is not dependent on the student

engaging in a particular behavior. Contingent praise requires the student to engage in a desired behavior to earn the praise (Conroy et al., 2008). When a teacher gives behavior specific praise, they identify what the student is being praised for (Conroy et al., 2008). Behavior specific praise acts as a reinforcer for new behaviors and for already learned behaviors, thus also reducing future problem behavior (Stormont et al., 2007). Stichter and colleagues (2009) conducted research comparing Title One schools to non-Title schools. In the Title One schools, at least half of the students came from low-income families (Stichter et al., 2009). According to Stichter's study (2009), teachers in these Title One schools provided more negative feedback than teachers in non-Title schools, suggesting discrepancies in teacher behavior exist depending on the population taught.

In the educational literature, praise is traditionally conceptualized as a consequence, as it is applied after a behavior occurs in order to reinforce it and increase the likelihood that behavior will occur again in the future (Jenkins et al., 2015). However, praise can also be conceptualized as an antecedent strategy (Kern & Clemens, 2007). Classrooms where teachers provide ample praise to their students tend to have more positive student behaviors and fewer disruptive behaviors (Floress et al., 2018; Kern & Clemens, 2007). Kern and Clemens (2007) speculated this is because the students recognize there are opportunities to receive praise, and thus, engage in behaviors they believe will get them praise. Thinking of praise as a feature of a classroom environment - something relatively stable, regardless of student behavior - can help teachers more easily incorporate praise into their behavior management plan. Additionally, consistent with social learning theory, research suggests students are more likely to engage in appropriate classroom behaviors after witnessing other students receive praise for those behaviors (Bandura & McDonald, 1963; Bandura, et al., 1963; Blaze et al., 2014). In this context, praise is an

antecedent strategy for peers in the classroom. Praise acting as both an antecedent strategy and consequence underscores the impact it can have on student behavior and the importance of increasing its use in classrooms. Thus, it is critical to consider praise as part of the literature on antecedent strategies, in addition to the more traditional conceptualization as a consequence.

Multiple studies have found teachers provide higher rates of academic praise to students seen as meeting high expectations than students that are not perceived as meeting these high expectations, even when the number of opportunities to praise the students is accounted for (Brophy, 1981). Higher rates of appropriate response are associated with lower rates of challenging behaviors in the classroom (Owens et al., 2018). Praise has also been demonstrated to increase on-task behavior, particularly when the praise identifies what the student is being praised for (Chalk & Bizo, 2004). Teachers must create opportunities for students to be successful and they must praise students for their efforts (Banks, 2014; Yeung et al., 2015). Praise has been identified as an effective means of promoting positive classroom behavior and school achievement (Kern & Clemens, 2007; Martella et al., 2012). It is also free and not time-consuming (Brophy, 1981). According to Banks (2014), it is important to balance the amount of praise and corrective feedback given to students. It has been suggested by many researchers that a ratio of four positive interactions to one negative interaction should be used by teachers (Good & Grouws, 1977; Kalis et al., 2007; Lewis & Sugai, 1999); while Musti-Rao and Haydon (2011) suggested that ratio should be even higher (five to one).

Research also suggests praise and corrective feedback provided to students should specifically identify the aspect of student behavior being addressed (Banks, 2014). Behavior specific praise should be used over non-specific praise (Martella et al., 1993; Martella et al., 1995; Martella et al., 2012). According to Sutherland and colleagues (2000), specific praise can

increase student on-task behavior. Brophy (1981) suggests effective praise can be both encouraging and informative for students. Yet, research indicates teachers respond more frequently to inappropriate behaviors they wish to decrease than appropriate behaviors they want to increase (Blaze et al., 2014). Blaze and colleagues (2014) state teacher praise does not occur at high rates in classrooms at any grade level, but particularly at the secondary level.

Blaze and colleagues (2014) applied Bandura's social learning theory to the use of classroom praise. According to Bandura's theory and research, children's behavior can be altered by observing the actions of others, a concept called observational learning (Bandura & McDonald, 1963; Bandura, et al., 1963). Houghton and colleagues (1990) as well as Blaze and colleagues (2014) assert students who observe another student receive praise, even when they cannot hear what the teacher says, will then engage in that behavior to obtain praise themselves. In a study conducted by Blaze and colleagues (2014), the authors found both loud (so other students could hear) and quiet (so it could only be heard by the target student) praise given to an individual student increased appropriate behavior and decreased disruptive behaviors for the class. Research also suggests social behaviors influence academic performance (Malecki & Elliott, 2002). Improving students' behavior can lead to significant academic improvements as well. Managing student behaviors therefore has a significant and lasting impact on multiple aspects of students' lives.

Teachers who use higher rates of praise statements report being more efficacious regarding classroom behavior management (Reinke, et al., 2013). Moreover, teachers who effectively reduce disruptive behaviors experience greater self-efficacy and are more likely to incorporate active learning methods in their classrooms (Freiberg et al., 2009). Teachers who are

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able to use praise and other antecedent strategies to improve classroom climate and student behavior are able to also improve student academic achievement (Freiberg et al., 2009).

**Teacher movement.** Teacher movement around the classroom has been identified as one of many features of effective classroom management (Anderman et al., 2011; LeFebvre & Allen, 2014; Sutherland et al., 2008). Evertson (1989) suggested teachers are better able to monitor students' understanding when they circulate the classroom. It has also been proposed that teacher proximity to students can help reengage off-task students (Lewis & Sugai, 1999). Research on proximity has generally found that behavior improves when teachers physically move themselves closer to the target student (Brophy, 1983; Conroy et al., 2004). Some classroom management programs include the use of proximity to students as a means of reducing disruptive behaviors (Reinke, et al., 2018). It has also been suggested that more effective teachers created proximity to their students more frequently (Eldar, et al., 2018). A study by Colvin and colleagues (1997) suggested teacher movement was a critical component of active student supervision. Some studies have suggested engaging in active supervision, which includes physically moving around the room, reduces problem behaviors in classrooms (Colvin et al., 1997; DePry & Sugai, 2002).

In a study by Anderman and colleagues (2011), high school students identified teachers who moved around the classroom as teachers who promoted student learning and motivation. The authors suggest teacher movement helps teachers build and maintain rapport, support students' understanding of academic content, and manage classroom behavior (Anderman et al., 2011). In their study, the authors found effective teachers engaged in a high degree of physical movement around their classrooms, regardless of the structure of the activities. Anderman and

colleagues (2011) wrote teacher movement provided opportunities for students and teachers to interact.

Most of the literature on teacher movement is part of research on immediacy and proximity. Teacher immediacy is defined by Andersen and Andersen (1982) as verbal and nonverbal behaviors exhibited by teachers, which create a sense of psychological closeness with their students. In research on immediacy, teacher movement is one nonverbal behavior often noted as contributing to teacher immediacy (Anderman et al., 2011; LeFebvre & Allen, 2014). Chesebro and McCroskey (2001) described teacher movement as a "highly-effective" teaching behavior that contributes to nonverbal immediacy. Teacher immediacy has been linked to a number of positive student outcomes, including achievement and motivation to learn (Chesebro & McCroskey, 2001; Frymier et al., 2019; Teven & Hanson, 2004; Witt & Wheeless, 2001).

Additional research on teacher movement is needed to better understand how it can best be utilized to improve student behavior and achievement. Current research fails to identify whether teacher movement alone influences student behavior or if it is the mechanisms by which movement effects students. Teacher movement could act as a discriminative stimulus, meaning a certain student behavior is more likely to occur in its presence (Michael, 1980). When a teacher moves closer to a student, it cues the student to the opportunity for praise or punishment. Likewise, when a teacher moves away from the student, the opportunity for praise or punishment is diminished. This stimulus can influence the way a student behaves in any given situation.

**The Influence of Class Size on Behavior**

Class size is a classroom feature that teachers typically have no control over. Despite this, research suggests class size influences student behavior (Finn & Achilles, 1999; Finn et al., 2003; Glass & Smith, 1979; Mathis, 2017; Schanzenbach, 2014). Smaller class sizes are often

touted as being better for students (Salgado et al., 2018). Fewer students in a class allows

teachers to spend more time on instruction and less on classroom management (Finn & Achilles,

1999; Finn et al., 2003). Smaller class sizes also allow students to be more engaged and

participate more in class (Dee & West, 2011; Finn & Achilles, 1999; Finn et al., 2003). Research

suggests students in smaller classes are more likely to be on-task, spend less time waiting for the

next task, and have less down time (Finn & Achilles, 1999; Finn et al., 2003; Schanzenbach,

2014). There is even evidence to suggest that class size matters regardless of the efficacy of the

teacher (Schanzenbach, 2014). The findings of several studies support the idea that children in

classes with 15 or fewer students perform better academically and have fewer discipline referrals

(Glass & Smith, 1979; Mathis, 2017). It has also been suggested that teacher satisfaction is

increased by teaching smaller classes (Finn et al., 2003; Graue & Rauscher, 2009).

In a seminal study completed by Coleman and colleagues in 1966, achievement was

found to negatively correlate with class size. Coleman and colleagues (1966) collected data on

thousands of students in grades one, three, six, nine, and twelve. A meta-analysis completed by

Glass and Smith in 1979 found a strong negative relationship between class size and

achievement. Glass and Smith (1979) wrote that when other factors are kept equal, students learn

more in smaller classes. The authors also stated there was a stronger negative relationship

between class size and achievement in secondary grades (Glass & Smith, 1979). A significant

difference was not found across different subjects or based on the cognitive assessment scores of

students (Glass & Smith, 1979).

Jepsen and Rivkin (2009) studied the influence of an expansive education reform in

California that focused on reducing class sizes. The authors found that smaller classes increased

math and reading achievement, but the increase in early career teachers and teachers without

certification reduced the effects of the smaller classes (Jepsen & Rivkin, 2009). They also found schools with larger numbers of economically disadvantaged students were disproportionately affected by the increase in less experienced teachers (Jepsen & Rivkin, 2009). Some studies have found the positive effects of small class sizes are sustained by students past the years when they are participating in those classes (Ehrenberg et al., 2001; Finn et al., 2001). Although the specific mechanisms leading to these correlations were not studied, it is likely that students have more opportunities to receive praise and more opportunities to respond during instruction when class sizes are smaller. This demonstrates the complex relationship between class size, teacher behavior, student behavior, and student achievement.

While there is a significant body of research investigating the influence of class size on academic achievement, less is known about the effects of class size on student behavior (Pedder, 2006). Although we know class size influences student behavior and academic achievement, there is still much to learn. Including in rural setting (Arias & Walker, 2004; Finn & Achilles, 1999; Finn et al., 2003; Glass & Smith, 1979; Schanzenbach, 2014). Zahorik (1999) wrote smaller class sizes led to reduced problem behavior. Smaller class sizes may provide teachers with more opportunities to employ antecedent strategies, like proactively providing students with praise for appropriate behavior. Zahorik (1999) also suggested problem behaviors can be addressed more quickly and effectively in a smaller class. Graue and Rauscher (2009) said teachers are more tolerant of problem behaviors in smaller classes. When considering how classroom features influence on-task behavior, class size is an important factor to consider. Understanding the influence of class size on student behavior can assist in policymaking and program planning for schools.

**Conclusion**

Identifying classroom features that influence student behavior can assist in improving outcomes for students. Previous research suggests using a well-rounded classroom management approach, including antecedent strategies, reinforcement, and corrections, is effective in increasing desired behaviors and reducing unwanted behaviors. Some antecedent strategies supported by the literature are the use of praise and teacher movement. Reducing class sizes has also been demonstrated to improve student behavior in the classroom. Improving classroom behavior is associated with better academic and social outcomes for students (DeLisi & Vaughn, 2014; Egger & Angold, 2006; Kellam et al., 2008; McClelland, et al., 2000). Research also suggests improving classroom behavior has positive outcomes for teachers (Freiberg & Stein, 2003; Lewis, 1999; McKinney, et al., 2005). Identifying effective methods of classroom management can lead to a variety of positive short and long-term outcomes for students and teachers alike.

There is substantial evidence demonstrating the effectiveness of positive praise, a statement of approval or positive affect, as an intervention to increase on-task behavior (Chalk & Bizo, 2004). It has also been demonstrated that specific praise, a statement identifying what positive behavior is being exhibited (Dweck, 2000), can be even more effective (Chalk & Bizo, 2004). Despite this evidence, however, research suggests teachers generally use behavior specific praise infrequently in their classrooms (Brophy, 1981; Jack et al., 1996; Owens et al., 2018; Stichter et al., 2009). Teachers should increase the ratio of praise to corrections given to students so they are at a four or five to one ratio (Banks, 2014; Good & Grouws, 1977; Kalis et al., 2007; Lewis & Sugai, 1999; Musti-Rao & Haydon, 2011). It is also important that teachers focus on providing specific praise, over non-specific praise (Martella et al., 1993; Martella et al., 1995;

Martella et al., 2012). In addition to the positive impact on students, teachers who praise their students more frequently report being more efficacious in regard to behavior management (Reinki et al., 2013).

Teacher movement is another classroom feature with evidence to support its effectiveness in improving student behavior. Researchers have suggested teachers are better able to monitor their students' understanding of concepts when they circulate the room and re-engage off-task students using proximity (Colvin et al., 1997; DePry & Sugai, 2002; Evertson, 1989; Lewis & Sugai, 1999). A study by Anderman and colleagues (2011) found effective teachers moved around their classroom often, creating opportunities for teachers to interact with their students. Other researchers have suggested teacher movement contributes to psychological closeness between teachers and their students, which is linked to positive outcomes for students (Anderman et al., 2011; Andersen & Andersen, 1982; Chesebro & McCroskey, 2001; Frymier et al., 2019; LeFebvre & Allen, 2014; Teven & Hanson, 2004; Witt & Wheeless, 2001).

Class size is a classroom feature that can influence student behavior, with smaller class sizes generally being seen as superior (Finn & Achilles, 1999; Finn et al., 2003; Glass & Smith, 1979; Mathis, 2017; Salgado et al., 2018; Schanzenbach, 2014). Studies show teachers with smaller classes are able to spend more time on instruction and less time managing student behaviors (Finn & Achilles, 1999; Finn et al., 2003). Research suggests students in classes of 15 or fewer perform better academically and receive fewer disciplinary referrals compared to classrooms with larger numbers of students (Glass & Smith, 1979; Mathis, 2017). However, despite clear evidence of a negative relationship between class size and academic achievement, there is less research demonstrating the relationship between class size and student behavior.

This study seeks to extend the current literature on ratios of praise to corrections, teacher movement, and class sizes as they relate to improving on-task behavior in students. In this study, the following research questions were addressed:

(a)  Does class size influence the amount of praise given by teachers?

(b)  Does class size influence teacher movement around the classroom?

(c)  Does the frequency of praise given to students by teachers influence student on-task behavior?

(d)  Does teacher movement around the classroom influence student on-task behavior?

It was hypothesized that the answers to questions (a) and (c) would parallel the findings of previous studies, with larger class sizes leading to reductions in praise given and increases in praise being associated with more on-task behavior. It was also hypothesized that larger class sizes would lead to reductions in teacher movement around the classroom and that more teacher movement would be associated with greater amounts of on-task behavior.

Methodology

**Context**

      The Fall 2019 G-Study, conducted by several collaborators located in Oklahoma, involved recording hundreds of hours of video footage of classrooms using a fisheye lens and coding the videos using the *Bx Management Tool*, which will be described in more detail below. The purpose of the G-Study was two-fold: to obtain the psychometric properties of the Bx Management Tool in order to validate it and to provide a baseline for consultation with teachers. The teachers who participated in the G-Study chose the variables they wanted to work on over the course of a school year, although the same measure was used to quantify select teaching behaviors across all participants. All of the teachers provided permission to be recorded and the study was approved by the IRB at Oklahoma State University. Teachers were observed once per day for 12 to 18 days, with a range of 4 to 14 observations per teacher, with most teachers being observed at least 10 times. In addition to teacher behavior, student on-task behavior was recorded. Students' use of technology was also measured using an SAMR (Substitution, Augmentation, Modification, Redefinition) Observation Tool, but this data was not used in the present study. Data collected through video coding was compiled into a spreadsheet. Permission was given by the Osage County Interlocal Cooperative for the data to be used in the present study.

**Setting**

      Data was collected in elementary classrooms in Osage County, Oklahoma. Demographic data was available for 6 elementary schools through the Oklahoma School Report Cards (Oklahoma Education, 2023). Two of these schools were federally designated for Comprehensive Support and Improvement (Oklahoma Education, 2023). Students were largely

White (30% to 59%) and American Indian (17% to 49%), and a majority of students were considered economically disadvantaged (66% to 80%; Oklahoma Education, 2023). The county is approximately 73% rural (U.S. Census Bureau, 2020).

**Participants**

Data was collected in the classrooms of 13 teachers in Osage County, Oklahoma. Detailed demographic information about the teachers who participated in the original Fall 2019 G-Study was not available at the time of completing the present study.

**Instruments**

The Osage (OK) County Interlocal Cooperative developed a comprehensive teacher consultation protocol involving support with behavior management. In order to accomplish their goal of improving academic and behavioral outcomes through teacher consultation, the Bx Management Tool was developed. The Bx Management Tool measures teacher and student behaviors. For teachers, active supervision, selective script, and praise and correction are measured. Active supervision is comprised of teacher movement and teacher visual scanning of the classroom. Selective script refers to effective directions given by the teacher, which must include *conversation* level, *actions* students should physically do, and the *next steps* expected from the student. Praise includes all statements designed to reinforce student behavior, while corrections are statements indicating an incorrect response or behavior. For students, class-wide on-task behavior is measured using whole-interval recording and presented as a percentage of time for each observation period. On-task behavior includes the student being oriented toward the teacher or task, having their materials, following directions, and demonstrating they are listening via verbal and nonverbal means (Allday et al., 2011). The data collected using the Bx

Management Tool is meant to inform the consultation process so effective teacher behaviors can be increased and resulting outcomes of student behavior can be observed.

Active supervision was measured by teacher movement and teacher visual scanning of the classroom. This behavior is meant to deter problem behavior and promote academic engagement (Depry & Sugai, 2002). To measure teacher movement, the observer tallied each time the teacher moved into a new quadrant in the classroom. Movement within a quadrant was not tallied. The observer also tallied each instance of visual scanning. Visual scanning was defined as, "visually sweeping the room (i.e., physically moving head side to side, moving eyes side to side) to look over area of the classroom in which students are present" (p. 6).

The measurement of selective script is meant to quantify a teacher's ability to provide effective directions to a group of students or an entire class. Observers also take qualitative notes on the teacher's instructions and the students' behavior in response. The Bx Management Tool uses a "CAN Model" for defining effective directions. This type of direction includes *conversation* level, *actions* students should physically do, and the *next steps* expected from the student. The Bx Management Tool also notes when teachers signal students, meaning they use a phrase to cue students to the fact that directions are about to be given.

The praise and correction measures are meant to measure the teacher's ability to give behavior-specific praise to students. They also capture the ratio of praise statements to corrective statements. Behavior specific praise was defined as a statement that reinforced desired student behavior, which included the specific student or group of students being praised, a positive praise statement, and a statement of the behavior being praised. The observer measured academic responding praise, non-behavior specific praise, and behavior specific praise to determine the overall ratio of praise to corrections. Academic responding praise was defined as a statement

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reinforcing a correct response to an academic question. Non-behavior specific praise was defined as a positive statement that did not clearly indicate the behavior being reinforced. Each type of praise was tallied to obtain a frequency.

The Bx Management Tool codes 30 minutes of video recording. The 30-minute video is split into five-minute intervals. A randomization app was used prior to the video observation to determine the order in which each variable was measured. One of the three teacher variables (active supervision, selective script, praise and correction) was measured within each five-minute interval.

On-task behavior and teacher movement were measured simultaneously across intervals. On-task behavior was measured using the On-Task Behavior and SAMR Observation Tool. This tool uses the Allday et al. (2011) definition for on-task behavior:

> actively participating in the designated activity by (a) being oriented toward the teacher or task, (b) having necessary materials, (c) following teacher directions, and (d) listening through verbal (e.g., asking questions) and nonverbal (e.g., nodding head or eye contact) means (p. 364).

The tool allows for differentiating active and passive student engagement, but this was not be used for the present study. Rather, they are combined into a single behavior. The tool uses whole-interval recording, every 15 seconds, to measure on-task behavior at the class-wide level. The observer rotates clockwise through all of the students in the class, observing one student per interval, during the observation period. Teacher movement is measured using a frequency tally

of every time the teacher moves into a new quadrant of the classroom. Prior to the observation, the classroom is split into four equal sections.

Interobserver agreement on the tools was considered established once each rater had 90% agreement with the recording from an expert observer. Interobserver agreement was required to be established twice for each component of the tool (active supervision, selective script, and praise and correction) for an observer to be considered trained on the instrument. Per the agency that collected the data, interobserver agreement was established once for each rater after they achieved at least 90% agreement with a master sheet, twice for each component of the Bx Management Tool (e.g., active supervision). Additionally, raters were randomly assigned to 20% of all videos with some observer overlap.

**Data Analyses**

Descriptive statistics, including means and standard deviations, were calculated to summarize the data. The average class size and the variation in class size were reported using these statistics. Additionally, the number of classes involved in the study were reported.

In order to better understand teacher behavior and its' influence on student behavior, simple regression analyses was used to calculate the size and direction of the relationships between factors. To aid in the interpretation of the findings described above, *p*-values and confidence intervals were calculated. A *p*-value of .05 was used to determine statistical significance. A confidence interval of 95% was used to determine the range in which the true population statistic should fall.

**Influence of class size.** Descriptive statistics were used to summarize basic information about the size of the classes involved in the study and how much variation there was in the size of the classes. Simple linear regression was used to estimate the relationship between class size

and the amount of praise given by teachers to students. The statistical analyses determined if larger class sizes are associated with more praise given, less praise given, or if there is no relationship. The analysis estimated the size of the relationship. In order to calculate these statistics, class size was entered as the independent variable. Due to the low number of praise statements made, general and specific praise were combined. The average amount of praise for each individual teacher was entered as the dependent variable. These statistical models predicted the frequency of praise based on class size.

Simple linear regression was also used to estimate the size and direction of the relationship between class size and teacher movement in the classroom. The analyses determined if teachers of larger classes tended to move around the classroom more, less, or if there was no relationship between the two variables. Again, class size was entered as the independent variable. The average frequency of movement for each teacher was entered as the dependent variable. These statistical models predicted the amount of teacher movement based on the number of students in the class.

**Influence of teacher praise.** Descriptive statistics were used to summarize the data on teacher praise. The average amount of praise provided was reported, as well as variation in the amount of praise provided. A simple linear regression model was used to estimate the size and direction of the relationship between how frequently a teacher provides praise to a student or students and on-task behavior in students.

To calculate the relationship between praise and on-task behavior, the average frequency of praise for each teacher was entered as the independent variable. The average on-task behavior for that teacher across independent observations was entered as the dependent variable. This

statistical model predicted student on-task behavior based on the frequency of praise provided by the teacher.

**Influence of teacher movement.** Descriptive statistics were reported to demonstrate the amount of teacher movement occurring in classrooms. The average amount of movement and variation in movement by teachers was presented. Teacher movement was included as an independent variable in the simple linear regression described above, which looked at the relationship with on-task behavior, the dependent variable. To do so, the average frequency of movement was calculated for each teacher and used as an independent variable. This statistical model predicted student on-task behavior based on the frequency of teacher movement in the classroom.

| Independent Variable | Dependent Variable |
|---|---|
| Class Size | Amount of Praise (General and Specific) |
| Class Size | Frequency of Teacher Movement |
| Amount of Praise (General and Specific) | Student On-Task Behavior |
| Teacher Movement | |

Results

## Descriptive Statistics

The mean and standard deviation was calculated for each variable measured, including

class size, amount of praise given, teacher movement, and student on-task behavior. Data were

collected in 13 classrooms with an average class size of 17.85 students. Class sizes ranged from

12 to 23 students and 30-minute observations were conducted. On-task behavior data were

unavailable in one classroom. The mean number of praise statements given was .32 and ranged

from an average of .03 praise statements per observation to an average of 1.38 praise statements

per observation. The mean frequency of teacher movement was 12.81 and ranged from an

average of 5.34 movements per observation to an average of 18.44 movements per observation.

Finally, the mean percentage of on-task behavior was calculated to be 84.51% and ranged from

an average of 56.72% per observation to an average of 93.99% per observation.

**Table 1**
*Descriptive Statistics of Independent and Dependent Variables: Class Size, Teacher Praise,*
*Teacher Movement, On-Task Behavior*

| Variable | Mean | Standard Deviation |
| --- | --- | --- |
| Class Size | 17.85 | 5.15 |
| Teacher Praise | 0.32 | 0.35 |
| Teacher Movement | 12.81 | 4.73 |
| On-Task Behavior | 84.51 | 11.08 |

## Influence of Class Size on Teacher Praise and Teacher Movement (Research Questions A and B)

Simple regression was used to calculate the size and direction of the relationship between

class size and the number of praise statements given. There was a negative relationship between

class size and teacher praise, $r(12) = -.05$, meaning, the larger the class, the fewer praise

statements given. However, the relationship was not significant, $p = .867$). Approximately 0.3%

of the variance in teacher praise can be explained by class size (see table 2).

The size and direction of the relationship between class size and the frequency of teacher

movement in the classroom was also calculated using simple regression analyses. Unlike the

relationship between class size and praise statements, this correlation was positive, $r(12) = .495$,

indicating larger class sizes were associated with more teacher movement. This relationship was

not significant, $p=.085$. Approximately 25% of the variance in teacher movement can be

explained by class size (see table 2).

**Table 2**
*Regression Coefficients of Class Size on Dependent Variables*

| Dependent Variable | $r$ | $r^2$ | Std. Error | Sig. | $df$ | $b$ |
|---|---|---|---|---|---|---|
| Praise Statements | -.052 | .003 | .361 | .867 | 12 | -.003 |
| Teacher Movement | .495 | .245 | 4.291 | .085 | 12 | .455 |

Of note, there was minimal variance (SD = 0.35) in the average number of praise

statements provided by each teacher (see Figure 1). As was noted in Table 1, the average number

of praise statements provided by each teacher was only 0.32. Only one teacher averaged at least

one praise statement per observation.

**Figure 1**

*Distribution of Praise Statements*
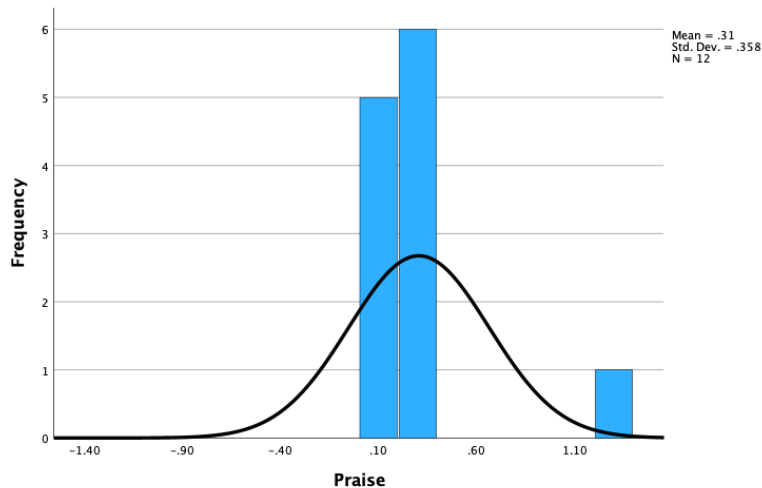


**Influence of Praise Statements on Student On-Task Behavior (Research Question C)**

Simple regression was used to calculate the size and direction of the relationship between the average number of praise statements given by teachers and the percent of time students were on-task. A positive relationship was calculated, indicating on-task behavior was higher in classes where teachers gave more praise, $r(11) = .188$. The relationship was not significant at the $p <$ .05. Approximately 3.6% of the variance in on-task behavior can be explained by the amount of praise given by teachers.

**Table 3**
*Regression Coefficient of Praise Statements on Dependent Variable*

| Dependent Variable | $r$ | $r^2$ | Std. Error | Sig. | $df$ | $b$ |
|---|---|---|---|---|---|---|
| On-Task Behavior | .188 | .036 | 11.411 | .557 | 11 | 5.800 |

**Influence of Teacher Movement on Student On-Task Behavior (Research Question D)**

Simple regression was used to calculate the size and direction of the relationship between the average amount of teacher movement in the classroom and on-task behavior in students. A positive relationship was calculated, suggesting on-task behavior was higher in classes where

teachers moved around the classroom more often, $r(11) = .445$. However, the relationship was not significant at the $p < .05$ level. Approximately 19.8% of the variance in on-task behavior can be explained by the frequency of teacher movement in the classroom.

**Table 4**
*Regression Coefficient of Teacher Movement on Dependent Variable*

| Dependent Variable | $r$ | $r^2$ | Std. Error | Sig. | $df$ | $b$ |
|---|---|---|---|---|---|---|
| On-Task Behavior | .445 | .198 | 10.407 | .148 | 11 | 1.034 |

Discussion

**Relationships Between Class Size, Teacher Behavior, and Student Behavior**

      This study sought to better understand the connection between class size, teacher behavior, and student behavior. Previous research suggests smaller class sizes and classroom management that employs antecedent strategies, like teacher movement, and consequences are effective in improving student behavior in the classroom. Improvements in classroom behavior are also linked to improved student outcomes and teacher satisfaction (Finn et al., 2003; Freiberg, et al., 2009; Graue & Rauscher, 2009). Thus, the current study, although results were not significant, could help provide valuable information on simple and cost-effective ways of improving short and long-term outcomes for students and improving teacher job satisfaction.

      The first two research questions asked if class size affects the amount of praise given by teachers and the amount teachers move around the classroom. It was hypothesized that larger class sizes would result in less praise and less movement. Although the findings were not statistically significant, the study found that fewer praise statements were given in larger classrooms, which is consistent with the previously stated hypothesis. Alternatively, larger classes were associated with more teacher movement. This finding was inconsistent with what was hypothesized. It is possible teacher movement was higher in larger classrooms because teachers needed to move around the classroom more in order to gain proximity to more students (e.g., answer questions, look at their work).

      It was also hypothesized that larger numbers of praise statements given would be associated with more on-task behavior in students in response to research question C. This study did find more student on-task behavior in classes when more praise statements were given; however, this association was not statistically significant. This is consistent with previous

research, which found on-task behavior increased when teachers provided praise (Chalk & Bizo, 2004).

Research question D asked if the amount of teacher movement affects student on-task behavior. It was hypothesized that more teacher movement would be associated with greater on-task behavior in students. This association was found, but was not statistically significant. This is consistent with previous findings, which suggest teachers who move around the classroom more are better able to monitor their students and that they improve student on-task behavior through physical proximity (Brophy, 1983; Conroy et al., 2004; Evertson, 1989; Lewis & Sugai, 1999).

**Implications of Findings**

This study found that smaller class sizes were associated with increases in teacher praise. Although the finding was not statistically significant, the direction of the relationship was consistent with the hypothesis and suggests teachers have difficulty providing praise when they are managing a classroom with more students. It is important to note that the rates of praise given were very low across classrooms, with the average being less than one praise statement per observation period and only one teacher having an average number of praise statements of at least one per observation. The small amount of variance in this variable likely affected the strength of the relationship. With most teachers having few or no praise statements, it was impossible to establish a relationship with on-task behavior.

This finding is also consistent with previous research findings, which have shown that praise is provided to students at low rates (Brophy, 1981; Blaze et al., 2014; Owen et al., 2018) and that teachers provide more corrections for challenging behavior than praise for positive behavior (Jack et al., 1996), despite evidence showing providing praise improves behavior and academic performance (Kern & Clemens, 2007; Martella et al., 2012), and perhaps this is most

beneficial in larger classrooms. This study included all types of praise statements due to the low number of praise statements provided, but it is also worth noting that not all praise is equal. Specific praise, meaning praise that directly identifies what is being praised, is more effective in improving student behavior (Martella et al., 1993; Martella et al., 1995; Martella et al., 2012; Sutherland et al., 2000). It is important to note that teachers observed taught in highly rural schools, serving an at-risk population. The significant floor effect observed in administering praise statements thus speaks to a concerning relationship between teacher preparation and the needs of at-risk students, and the lack of high quality administrative/consultative support in schools. Working with these teachers on increasing praise ratios likely represents a low-cost "Bang for buck" strategy to improve classroom climate and attendance.

Conversely, the data showed teachers moved more when they had larger classes. Although the relationship was not significant, this was likely due to low power resulting from the small number of classrooms where data were collected. It is possible teacher movement was greater in classrooms with larger numbers of students because teachers needed to move around the classroom more in order to gain proximity to the students. This is especially relevant due to the method of data collection, which only counted movement when a teacher moved into a new quadrant of the classroom. Teachers in all classrooms should be encouraged to move around the classroom more, as prior studies have demonstrated teacher proximity to students improves student behavior (Brophy, 1983; Conroy et al., 2004; Lewis & Sugai, 1999) and this is a method of improving behavior that does not require time or cost.

With ever increasing demands on teachers and their time, as well as the movement towards more inclusive classrooms, it is imperative that teacher training programs provide future teachers with effective tools they can easily apply in their classrooms to improve student

behavior and engagement. Research shows that many teacher training programs do not have specific requirements related to behavior management (Stevenson, 2020). Thus, training programs should universally include behavior management coursework requirements. Professional development for teachers provided by school districts should also incorporate simple behavior management strategies, like those suggested to be effective in the current study and prior research, and tangible ways to employ those strategies. Simple methods like increasing the frequency of behavior specific praise and moving around the classroom more often to increase proximity to each student do not require significant time, effort, or cost (Banks, 2014; Kern & Clemens, 2007). They also do not require extensive training in order to be applied effectively. Ensuring teachers are able to employ these simple strategies can help improve student outcomes and increase teacher job satisfaction, thus reducing teacher turnover.

Lastly, the information gathered regarding the impact of class size on praise statements, in conjunction with previous research on this topic, should be considered in classroom planning. Although not statistically significant, the current study found a negative relationship between class size and the amount of praise provided by teachers. Additionally, increased praise is associated with greater on-task behavior by students (Anderman et al., 2011; Brophy, 1981; Chalk & Bizo, 2004; Kern & Clemens, 2007; LeFebvre & Allen, 2014). This relationship, though not significant, was also found in the current study. As such, schools should attempt to limit the number of students in each class and teachers should be aware of how factors outside of their control, like class size, may impact their behavior in the classroom. That is, if class sizes are larger (with a range of -1SD to +1SD in the current study going from 12.70 students to 23.00 students), administrators and consultants should know this potentially may inhibit already low levels of positive praise, creating a spiraling effect where teachers under increased classroom

management pressure lean on overlearned behaviors, such as negative consequences. By using the information gathered in this study and others looking at related factors, schools and teachers can be proactive in their planning for behavior management.

**Study Limitations**

Several limitations exist within the current study, which could impact the results and generalizability of those results. First, data were only collected in 13 classes. This small sample size comes with low power, even for simple analyses, making it challenging to obtain significant findings. The small sample size also limits the generalizability of the study because the few classrooms used may not be representative of the true population. Although power was low, the correlation coefficient for the relationship between class size and teacher movement was high, $r$ = .50. With a larger sample size, and therefore greater power, this relationship likely would have been statistically significant. Generalizability was also affected by the limited area in which data were collected. Due to study constraints, the classrooms used were within a limited geographical area, which may not represent the teacher or student behaviors of other locations. At the same time, the study is unique in that the demographics represent highly rural populations, which are understudied. Finally, teachers were not required to participate in this study. Thus, teachers who choose to participate in a project like this where they will be observed and provided feedback may not represent the general population.

Finally, the low number of praise statements provided by teachers led to very little variance in this variable. Without variance, a strong relationship is unlikely to be found. The low number of praise statements observed across classrooms and the positive relationship between praise statements and on-task behavior are consistent with previous research (Brophy, 1981; Blaze et al., 2014; Chalk & Bizo, 2004; Owen et al., 2018); however, the size and significance of

the relationship were likely affected by the lack of variance in the teacher praise variable. Nevertheless, this floor effect is telling in its own right.

**Directions for Future Research**

There are several directions for future research to extend and expand upon the current study. First, the effect of praise and teacher movement should be studied further with a larger and more diverse sample of classrooms to increase generalizability. This may help to confirm or dispute the results of this study and make the results more generalizable to the true population. By studying a more diverse population, studies can also identify additional factors that affect teacher behavior (e.g., region, educational background) and factors that mediate between teacher behavior and student behavior. Additionally, praise statements should be further delineated into different types of praise (e.g., behavior specific, general praise statements, academic performance-based). Due to the small number of praise statements, this type of analysis was not possible in the current study. Previous research has demonstrated that, although specific praise is the most effective in improving student behavior (Chalk & Bizo, 2004; Martella et al., 1993; Martella et al., 1995; Martella et al., 2012; Sutherland et al., 2000), teachers are most likely to use non-specific praise in their classrooms (Brophy, 1981; Owens et al., 2018). Given this information and the findings of the current study, future research should seek to better understand the barriers to teacher implementation of this knowledge. One interesting possibility would be to coach teachers on the use of various types of praise statements and then replicate the analysis, thus ensuring there is a healthy distribution of scores prior to analysis.

In addition to using a more diverse sample of classrooms, the effect of various classroom factors on teacher behavior should be considered. Currently, there is a lack of research on the relationship between class size and the amount of teacher praise provided. Furthering our

understanding of this connection could also help us understand the benefits of smaller classrooms. Another classroom feature worth exploring is the type of classroom (e.g., general education classroom versus self-contained classroom) and how it affects the amount of teacher movement or praise. Although there is significant research on the impact of praise and rates of praise generally, there is little research comparing the amounts of praise across classroom types (Floress et al., 2017; Jenkins et al., 2015). Other factors to consider could be grade level and student achievement. Research could explore whether teachers provide more or less praise in classrooms for higher achieving students. It could also seek to determine if teachers provide more praise to higher performing students within a class, versus their peers who may need additional support.

Another area future research should explore is identifying additional teacher behaviors that affect student behavior. One teacher behavior that could be studied is teacher volume when speaking. This could be further broken down into different contexts. For example, do different classroom scenarios require different volumes in order to produce the best results (e.g., louder volume when introducing new topics, quieter volume when giving instructions). Studies have identified that teachers alter qualities of their voice, including volume, based on classroom factors (Lindstrom et al., 2011; Nusseck et al., 2018; Nusseck et al., 2022). Research has also found that the quality of teachers' voices can impact student comprehension of material (Imhof et al., 2014; Morton & Watson, 2001). However, the effectiveness of teacher volume changes on student behavior has not been thoroughly studied. Another teacher behavior that should be studied is rapport-building efforts, such as including pop culture references in instruction and using humor during class periods.

Prior research has identified the student-teacher relationship as a predictor of student success and motivation to learn (Den Brok et al., 2010; Frisby et al., 2016; McLaughlin & Carr, 2005). In addition to looking at additional teacher behaviors, research should broaden the student-related dependent variables used. For example, students' perspectives on their teachers' behaviors and their perspectives on their relationships with their teachers could be collected using questionnaires. Student engagement could also be measured using variables like the percent of the class that raises their hand to answer questions posed by the teacher. Another student behavior that could be used to measure teacher effectiveness in the classroom is the percent of students turning in assignments on time.

Future research should also seek to better understand teachers' knowledge of behavior management and competency in using those strategies; particularly as it relates to how teacher behavior affects student behavior. Research shows teacher knowledge of behavior management strategies is correlated with their use of those skills in the classroom and that teachers are more likely to use behavior management strategies when they have had specific training in that area (Moore, 2017; Zoder-Martell, 2019). Research on teacher knowledge of behavior management is more robust for elementary teachers than for secondary school teachers, so future research should place a greater priority on developing and examining behavior management skills among middle and high school teachers.

Additionally, future research should seek to better understand if teachers' accurate self-monitoring of their implementation of behavior management strategies affects future use of those tools. A significant body of research exists suggesting self-monitoring of teaching practices leads to improvements in those practices and improved student outcomes (Allinder et al., 2000; Bingham et al., 2007; Reinke et al., 2008; Rispoli et al., 2017). However, research on teacher

self-monitoring of behavior management strategies is less robust. Early research in this area suggests teachers' implementation fidelity improves when they engage in self-monitoring, even when they do so inaccurately (Briere et al., 2015; Rispoli et al., 2017). Having a better understanding of teachers' knowledge in this area, their self-awareness and ability to monitor their behavior management, as well as the differences between primary and secondary school teachers can inform teacher training programs.

Finally, research should seek to better understand factors that influence teacher behavior in the classroom, including what they have found helpful in improving their behavior management skills (e.g., trainings, supervisor feedback) and motivators to change their behavior in the classroom. Research has demonstrated the effectiveness of teacher training programs in improving teacher use of behavior management strategies. Studies show teachers are more likely to use behavior strategies in the classroom if they had specific training on those strategies (Moore, 2017; Zoder-Martell, 2019). Future research should identify what aspects of those training programs were most effective. Additionally, longitudinal studies should seek to identify if use of the behavior management strategies taught continues over time, or if there is reduced use of effective behavior management strategies as time passes since attendance of the training. This will help to understand how frequently trainings should be implemented and if strategies should be implemented to assist teachers in continuing to use the new skills they acquire.

**Summary**

Teachers encounter many challenges in their day-to-day work, one of the greatest being behavior management. Despite research showing the negative impact behavior problems in the classroom have on teachers and students, training on applied behavior analysis and behavior management strategies is severely lacking in teacher preparation programs. It is imperative that

teachers be provided with the knowledge and training on evidence-based practices that is needed in order to encourage prosocial behaviors in their classrooms. By not setting our teachers up for success in their classrooms, we are ensuring negative outcomes for students that can be prevented, and we are increasing job dissatisfaction and stress for teachers. Teaching simple research-based strategies in teacher training programs, like providing specific praise and increasing proximity to students, we can help our teachers succeed in their profession, and thus, help future generations reach their academic, social, and professional potential.

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