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Effects of Various Seating Arrangements on Disruptive Classroom Behavior

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EFFECTS OF VARIOUS SEATING ARRANGEMENTS ON DISRUPTIVE CLASSROOM
BEHAVIOR

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
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Doctor of Philosophy

in

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by

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ABSTRACT

Both class-wide behavioral interventions and antecedent strategies are commonly used to target disruptive behavior problems and improve classroom management. Typically, antecedent strategies precede behavioral interventions due to their proactive nature. Antecedent strategies, such as altering the classroom seating arrangement, may be more desirable to teachers than behavior interventions due to their simplicity and ability to be easily incorporated into existing routines. Past research, though limited, has demonstrated that row and column seating arrangements are associated with lower disruptions during independent work activities compared to group seating arrangements. In the first study, a multi-element design was used to compare rates of disruptive classroom behavior when utilizing three different seating arrangements (i.e., rows, pairs, and groups). Row and pair arrangements were associated with less disruptions than the group arrangement, and rows appeared slightly superior among all three. In the second study, rates of disruptive behavior were compared under three conditions: row and column seating, the Good Behavior Game, and both. All conditions resulted in decreased disruptive behaviors from baseline conditions (i.e., group seating arrangement). The greatest decreases were observed when the game was implemented, regardless of how the desks were arranged. Practical implications for decreasing disruptive behavior and directions for future research are discussed.

REVIEW OF LITERATURE

Increasing numbers of children are now displaying externalizing behavior problems that exceed the occasional behavioral incident that would be expected in childhood (Nelson & Roberts, 2000). Externalizing behavior problems encompass a broad range of undesirable behaviors, including defiance, aggression, impulsivity, antisocial acts, and disruptive acts in the classroom (Hinshaw, 1992). Despite the multitude of school-wide positive behavior efforts in effect, these challenging behaviors in educational settings remain a concern and continue to adversely affect learning. Disruptive behaviors in the classroom are currently among the most prevalent problems exhibited by children and contribute to 1/2 to 1/3 of all referrals to child mental health settings (Murphy, Theodore, Aloiso, Alric-Edwards & Hughes, 2007). According to estimates from the National Center for Education Statistics (2013), approximately 40% of public school teachers report that challenging behavior at their school interferes with instructional activities.

Thomas, Becker and Armstrong (1968) broadly defined disruptive behavior as any behavior that is incompatible with good classroom learning conditions. They identified five general classes of disruptive behavior: gross motor, noise making, orienting, verbalizations, and aggression. Gross motor includes physical behavior that is not required by the task, including standing without permission, walking around, skipping, jumping, and rocking or kneeling on one's chair. Noise making includes behaviors such as tapping one's feet, clapping, tearing papers, tapping on desk, and kicking a desk or chair. Orienting behaviors occur when students are turned towards another peer, showing objects to a peer, or looking at a peer without making any noise or verbalizations. Verbalizations include talking with peers, shouting at the teacher, screaming, singing, laughing, and whistling. Aggression includes any aggressive act displayed in the

classroom, such as pushing, hitting, pinching, or slapping a peer, destroying a peer's property, taking objects belonging to a peer, and throwing objects.

These disruptive behaviors are concerning in a classroom setting because they adversely affect student achievement by interrupting the learning process and reducing instruction time. Consequently, this makes it more difficult for students to succeed academically (Luiselli, Putnam & Sunderland, 2002). It is especially problematic for children when they display disruptive behavior patterns early. Children who display disruptive behaviors in preschool are more likely to continue engaging in disruptive behavior throughout their academic career (Campbell & Ewing, 1990). Further, preschool children with persistent disruptive behavior patterns are more at risk for maladjustment throughout childhood and adolescence (Campbell, 1995). Research suggests that as many as 25% of children in preschool display disruptive behavior problems that place them at-risk for developing negative outcomes later in life (Conroy, Sutherland, Haydon, Stormont & Harmon, 2009). In sum, chronic disruptive behaviors problems are associated with low academic achievement, low school attendance, substance abuse, depression (Dishion, Stormshak & Siler, 2010), poor performance on standardized tests, and increased risk for later anti-social behaviors (Stage & Quiroz, 1997).

Classroom Management

One factor contributing to disruptive classroom behavior is poor classroom management. Poor classroom management has been repeatedly linked with an increase in disruptive behavior problems and a decreased focus on academics (Bradshaw, Mitchell & Leaf, 2010). However, research consistently shows that when a teacher's behavior management skills improve, behavior problems decrease.

Generally, classroom management is defined as the practices and routines adopted by the teacher to establish order in the classroom and engage students (Emmer & Stough, 2001). Major components of good classroom management involve positive teacher and peer interactions, instructional methods that promote student responding and learning, and group management strategies to promote on-task behaviors. These approaches may be conceptualized as preventative because they aim to arrange the environment in such a way that disruptive behaviors are less likely to occur.

Beginning in the 1970's, research in the area of classroom management observed a positive relationship between student achievement and certain teacher management behaviors. Classrooms with higher student achievement had teachers that moved through instructional material at a brisk pace and gave clear directions and explanations. Not surprisingly, these teachers demonstrated many proactive behaviors, such as communicating clear expectations, monitoring student behavior, and engaging students in academic tasks, all of which served to minimize disruptions (Emmer & Stough, 2001). From this research followed two notions regarding classroom management. First, effective classroom management is preventative, not reactive, and established at the beginning of the school year. Second, classroom management is established by explicitly teaching students the appropriate behaviors they are expected to exhibit. At the start of the year, effective teachers teach expectations to students, set clear rules for behavior, teach classroom routines, monitor student behavior, and provide corrective feedback so that inappropriate behavior does not become routine (Emmer & Stough, 2001).

Kern and Clemens (2007) provide some considerations when establishing a system of behavior management in the classroom. Developing and teaching clear rules is a logical first step because it establishes the expectations students are expected to follow and provides clarity

regarding acceptable and unacceptable behavior. They advocate for establishing and teaching rules and expectations before other changes are made to the classroom management practices. Next, rule following should be consistently reinforced and rule breaking should result in appropriate, established consequences. After these strategies are in place, other strategies may be used, such as increasing opportunities to respond and increasing the instructional pace. Although the simultaneous implementation of these techniques is associated with effective classroom management, research has demonstrated that these techniques are also effective at increasing classroom management when implemented in isolation.

Several studies have examined the effects of a single teacher management behavior on children's observed behavior in the classroom. For example, explicitly teaching classroom rules and expectations significantly decreases disruptive behaviors. Johnson, Stoner, and Green (1996) found that when teachers simply taught classroom rules and expectations, disruptive behavior in seventh grade students decreased. Specifically, rules were reviewed at the beginning of the class period each day and behavior specific prompts and feedback were provided by the teacher. Providing frequent praise for rule following also reduces disruptive behaviors. Ferguson and Houghton (1992) and Pisacreta, Tincani, Connell, and Axelrod (2011) demonstrated that systematic increases in teacher praise for appropriate behavior resulted in higher observed on-task behavior and decreased disruptive behaviors. Research has also demonstrated that instructional techniques, such as increasing the opportunities to respond and providing clear instructions, can greatly impact student behavior in the classroom. Sutherland, Alder, and Gunter (2003) found that students with emotional and behavioral disorders were less disruptive *and* more on-task when opportunities to respond during an instructional lesson increased, which coincided with increased instructional pacing. Matheson and Shriver (2005) showed that

student's compliance with instructions and on-task behavior increased when teachers were trained to provide effective instructions. Specifically, teachers were trained to provide short, specific, and direct commands delivered one at a time and in a quiet voice.

Unfortunately, there is a general lack of teacher training in effective classroom management strategies. Despite the increasing amount of research in favor of positive behavior supports and antecedent strategies, many teachers do not receive sufficient training in techniques to proactively manage disruptive behavior. Therefore, many teachers continue to utilize a traditional system of behavior management, which tends to be more reactive than proactive (Colvin, Kameenui, & Sugai, 1993). Traditional behavior management techniques usually rely upon reprimands, loss of privileges, suspension, and expulsion to remediate disruptive behavior concerns. Many educators assume that students who experience these consequences will be motivated to behave appropriately and automatically adopt the behavioral expectations of the school (Colvin et al., 1993). However, research shows that these methods of behavior management result in lower levels of classroom management, more problematic behavior, and an overreliance on reactive management techniques (Stage & Quiroz, 1997). Conversely, *proactive* techniques that target the educational environment and directly teach rules and expectations are more effective at managing behavior than techniques that target the individual student *after* a problem behavior has occurred (Kern & Clemens, 2007).

Reducing Disruptive Behaviors

Given the prevalent nature of disruptive behaviors, many different types of interventions with varying intensity have been utilized in educational settings to reduce these behavior concerns. A meta-analysis conducted by Stage and Quiroz (1997) found that interventions targeting disruptive behaviors are generally effective when implemented in public educational

settings. Their analysis included the results of 99 studies examining the effects of 16 different categories of interventions ranging from class-wide interventions (e.g., group contingencies, point systems) to more individualized interventions (e.g., self monitoring interventions, time out or overcorrection). Disruptive behaviors were broadly defined as talking without permission, disturbing others, noise making, aggressive acts, and out of seat behavior. Of all participants included in their review, an average of 78% of students treated by any of these interventions displayed reductions in disruptive behavior compared to untreated controls. Regarding intervention type, the most effective interventions were those employing group contingencies (ES = -1.02), followed by self-management interventions (ES = -1.00) and interventions using differential reinforcement (ES = -.95). When analyzing the collective outcomes of these three intervention categories, approximately 85% of treated students demonstrated reductions in disruptive behavior compared to controls.

To implement school-based interventions, many schools have adopted a tiered framework of service delivery in which the intensity of an intervention is matched to the severity of the problem (Walker & Shinn, 2010). This Response to Intervention (RTI) framework consists of three tiers of increasing intensity. RTI logic requires that a student progress to a higher tier of intervention when the current tier has not been effective at remediating the concern. The first tier of service, Tier 1, contains universal interventions that are applied to all students in all settings. These interventions are intended to prevent adverse outcomes and are usually effective for about 80% of students (Walker & Shinn, 2010). Common Tier 1 interventions might include class-wide behavioral interventions or school-wide positive behavior supports. Students who do not respond to Tier 1 interventions advance to Tier 2 interventions, also known as secondary interventions. Tier 2 targets students at risk for developing adverse outcomes. Tier 2

interventions might include social skills groups or contingent rewards for good behavior. High efficiency and rapid responding are important qualities of secondary interventions. Typically, about 15% of students require Tier 2 interventions. Students who require more support than is provided by Tier 1 or Tier 2 are targeted by Tier 3, or tertiary, interventions. Tertiary interventions are highly individualized for the student and are based on thorough and comprehensive assessments. A Tier 3 intervention might include a highly individualized, function-based behavior plan to decrease a student's maladaptive behavior in the classroom. Approximately 5% of students require these intensive interventions (Walker & Shinn, 2010).

Within the context of RTI, several advantages are associated with universal or class-wide interventions. Morrison and Jones (2007) noted that these interventions are more cost effective, display more equality, and are more preventative than interventions at higher tiers. Since universal interventions target the entire population, there is an increased likelihood that academic and behavioral issues will be addressed early using minimal time and resources. Furthermore, all students are exposed to Tier 1 programs so no students are singled out or deprived of immediate services. Also, these interventions are preventative because they attempt to identify those students in need of services early and target problems that may worsen if left untreated. Universal interventions are easy to implement and often require little training. This quality is particularly important since school administration and teachers are usually responsible for implementing Tier 1 interventions. Additionally, universal interventions require little time and materials, which may lead to higher levels of acceptability.

Several universal interventions show extensive empirical support, including the Good Behavior Game (Barrish, Saunders & Wolf, 1969; Embry 2002; Tingstrom, Sterling-Turner & Wilczynski, 2006; Darveaux, 1984), Positive Peer Reporting (Morrison & Jones, 2007; Grieger,

Kauffman & Grieger, 1976; Bowers, 1999; Moroz, 2002; Bowers, Jensen, Cook, McEachern & Tara Snyder, 2008) and Positive Behavior Intervention Supports (Horner & Sugai, 2000; Sugai & Horner, 2009; Lewis, Jones, Horner & Sugai, 2010; McIntosh, Filter, Bennett, Ryan & Sugai, 2010). Effective Tier 1 interventions are paramount to school success because effective interventions at lower tiers reduce the need for interventions at subsequent tiers (Walker & Shinn, 2010).

Good Behavior Game

The Good Behavior Game is a simple universal intervention that can largely improve classroom behavior. It was originally designed by Barrish, Saunders, and Wolf (1969) as a simple strategy to decrease disruptions during instructional periods. They first tested the intervention using a multiple baseline design with 4th grade students during math and reading periods. Prior to the game, students displayed disruptive behaviors (i.e., talking or out of seat without permission) more than 80% of each class period; however, when the game was put into effect during math, disruptive behaviors decreased to 10%, while they remained high during the reading period. The game was then discontinued in math and implemented during reading. Disruptions during math increased back to baseline levels, while disruptions greatly decreased during reading. Due to the large improvements in behavior when the intervention was in effect, the Good Behavior Game emerged as an easy and effective way to improve classroom management and target common disruptive behaviors.

The Good Behavior Game is easy to implement, requires little teacher training, and uses few materials. To implement the intervention, the teacher divides the class into two teams and develops behavioral rules students must follow which are conducive with the rules of the classroom. Examples of rule breaking behavior and rule following behavior are provided to the

class. During the game, any time a student breaks one of the rules (i.e., displays a problematic behavior), that student's team gets a mark on the board accompanied by feedback from the teacher. At the end of the game, the team with the lowest number of marks wins and receives a reward. If both teams earn less than a preset number of points, both teams are rewarded.

The Good Behavior Game utilizes an interdependent group contingency, in which the entire group (i.e., team) is reinforced based on the performance of the group as a whole (Litow & Pumroy, 1975). Group contingencies are ideal components to classroom interventions because they reduce aggressive, noncompliant, and inappropriate behaviors, and increase on task behaviors (Gresham & Gresham, 1982; Murphy et al., 2007). In a meta-analysis conducted by Stage and Quiroz (1997), interventions that used group contingencies were the most effective at reducing disruptive behaviors when compared to other types of interventions, such as token economies and differential reinforcement. Compared to dependent and independent group contingencies, interdependent group contingencies have notable advantages. They are easier to manage, more cost effective (Skinner, Cashwell & Dunn, 1996), and more efficient for teachers (Gresham & Gresham, 1982) since the teacher is only responsible for monitoring and rewarding the group's performance instead of each individual student.

Since its creation, the Good Behavior Game has undergone numerous independent replications (Embry, 2002), all of which support its use as an effective behavioral intervention for the classroom. It has accrued much empirical support and demonstrates effects across different grade levels, disability types, and settings (Darveaux, 1984; Embry, 2002; Grandy, Madsen, & De Mersseman, 1973; Tingstrom, Sterling-Turner & Wilczynski, 2006). Research also shows that teachers generally find the intervention acceptable (Tingstrom, 1994).

Several studies have attempted to determine exactly which components make the Good Behavior Game effective for reducing disruptive behavior. For example, Medland and Stachnik (1972) examined the effects of the whole intervention package, as well as individual components including game rules, response feedback, and group consequences, using a sample of fifth grade students. They found that the entire intervention package produced the largest decreases in disruptive behaviors, as compared to any of the three individual game components. Not only did disruptions dramatically decrease when the game was in effect, but teachers also presented 25% more instructional material when playing the game. Harris and Sherman (1973) conducted a similar study with a sample of fifth and sixth grade students in which they analyzed additional components that were not included in the analysis by Medland and Stachnik (1972). Results showed that the “key ingredients” of the game included the low number of marks required to win the game, the division of students into teams, and positive consequences for the winners. Further, Warner, Miller, and Cohen (1977) compared the Good Behavior Game to teacher attention for appropriate behavior among fourth and fifth grade students. Not only was the Good Behavior Game more effective at improving student behavior, but it was also easier for teachers to implement.

Behavioral Vaccines

A behavioral vaccine is any simple routine or practice that greatly reduces some adverse outcome. Behavioral vaccines are unique in that they aim to prevent problems before they occur, as opposed to treating the problems after their occurrence. Common examples of behavioral vaccines include hand washing to reduce the spread of infections and wearing seatbelts in automobiles to prevent injury. These behaviors are relatively simple to implement, involve low costs and effort, and result in few side effects.

Due to its robust nature and effectiveness as a class-wide intervention, the Good Behavior Game has been nominated as a potential behavioral vaccine (Embry, 2002). The Good Behavior Game is a simple intervention with the potential to largely prevent negative outcomes associated with poor school behavior, including low achievement, substance abuse, and violent behavior. It is the only intervention implemented by teachers with documented long term effects at reducing antisocial acts, such as aggressive behavior and tobacco use in adolescence (Embry, 2002; Kellam & Anthony, 1998; Kellam, Mayer, Rebok, & Hawkins, 1998). Not only does the intervention improve student behavior, but the teacher's classroom management improves as well. The intervention requires the teacher to establish and teach classroom rules, consistently track student behavior, provide corrective feedback, and reinforce appropriate behavior, which are all behaviors consistent with effective classroom management practices (Emmer & Stough, 2001).

Antecedent Interventions

Antecedent intervention approaches aim to arrange the natural environment in a way that eliminates potential contributors to problematic behavior. This involves altering or changing events that precede problematic behaviors so that potential triggers are eliminated (Kern & Clemens, 2007). These types of interventions are much more proactive than consequences-based interventions because they allow educators to *prevent* the occurrence of disruptive behaviors, and reduce the likelihood of loss of instructional time due to these behaviors. Antecedent interventions are associated with many advantages over other types of interventions (Kern & Clemens, 2007). They can be easily incorporated into the school environment, are highly practical, demonstrate quick effects, and are often easier to implement than other types of interventions.

When employed at the school-wide or class-wide level, antecedent interventions help to establish good behavior management practices and foster an environment that is orderly and conducive to learning. Several large-scale studies have demonstrated the positive effects of antecedent strategies. For example, Colvin et al. (1993) developed and tested a school-wide program, Project PREPARE, for establishing, teaching, and reinforcing rules and routines. This program was implemented in an entire middle school and aimed to consistently teach and reinforce social behaviors in the same manner that academic behaviors were taught and reinforced. For example, to teach students to appropriately transition between settings and activities, educators first identified and clearly defined the rules and expectations (e.g., students will transition quietly with objects and body parts to themselves). Specific transition times were identified and practice times were scheduled. Next, procedures for teaching the rules (e.g., explain, discuss, model, role-play) and reminding students of the rule were clearly outlined. Reinforcement options and correction procedures were also established so that students received regular reinforcement and feedback on rule following behavior. The results of their efforts revealed noticeable decreases in disruptive behavior in the target school when compared to the control school. Further, office discipline referrals (ODRs) dropped 50% in the target school, whereas they worsened in the control school.

Nelson, Colvin, and Smith (1996) later adapted Project PREPARE for use in an elementary school. They were interested in the ability of the program to establish, teach, and reinforce school-wide rules and routines in specific school settings (i.e., common areas). Similarly, results of this study showed decreases in disruptive behavior and ODRs in these settings, as well as increased positive student and teacher interactions.

In a longitudinal study conducted by Nelson, Martella, and Galand (1998), the effects of school-wide efforts to promote adherence to school rules and routines were studied over four years in an elementary school. The intervention consisted of altering the ecological arrangement of the school and establishing, teaching, and reinforcing school rules and routines. Altering the ecological arrangement involved making adjustments to the school schedule for when groups of students would use common areas during arrival and dismissal times and lunch and recess periods. For example, adjustments were made so that students of similar grade levels accessed the areas at the same time to eliminate congestion problems and negative social interactions among students of differing ages. The ecological arrangement was also adjusted by reducing travel time to and from common locations, reducing the amount of wait time to enter and exit these locations, and providing visible signals to indicate movement. Rules and routines for each of the common areas were designed, taught, and reinforced. Specific behaviors for each common area of the school were defined in discrete and observable terms. Students were taught the rules and routines with high levels of adult supervision and provided with social reinforcement, corrective feedback, and periodic rewards. The school also adjusted their response to disruptive behavior by delivering systematic consequences for disruptive behavior, providing feedback on behavior, and avoiding negative social interactions between teachers and students. Overall, results of the study showed that ODRs decreased across the four year period of the study, with the greatest decreases apparent when the school also altered their response to disruptive behaviors.

Simple antecedent strategies employed in educational settings can drastically affect student behavior and the overall school environment. However, even with effective school-wide or class-wide strategies in place, some students may require additional supports to prevent

behavioral concerns. Antecedent strategies at the individual level have received similar empirical support, and might include techniques such as altering the difficulty of academic tasks, providing choice of academic tasks, providing scheduled attention, and increasing the predictability of the schedule (Kern & Clemens, 2007). Many students engage in disruptive behaviors during academic tasks because the task is too difficult and they do not possess the skills necessary to efficiently complete the tasks (Kern, Gallagher, Starosta, Hickman, & George, 2006). A simple antecedent strategy might match the assigned academic tasks to the student's instructional level, or reduce the length of academic tasks. Many students also engage in problematic behavior during academic work because the work is uninteresting. A simple antecedent strategy involves offering a choice of academic tasks (Kern et al., 1998) or allowing students to select the order in which academic tasks are completed. Another strategy to prevent problematic behavior involves providing scheduled access to adult or peer attention (Bambara & Kern, 2005). When students engage in problematic behavior to gain attention, providing attention routinely in the absence of poor behaviors may help reduce the behaviors. Finally, increasing the predictability of the classroom schedule may reduce problematic behavior that occurs during transitional times (Kern & Clemens, 2007). This might involve the use of visual schedules and numerous warnings before transitions times.

Seating Arrangements

Similar to the previously mentioned antecedent strategies, the classroom seating arrangement has the potential to affect the level of classroom management and the rate of disruptive classroom behavior (Wannarka & Ruhl, 2008). Classroom seating arrangements are usually under teacher control, and thus the teacher may choose from a variety of arrangements depending on the physical structure of the classroom and the goals of the classroom activities.

There are numerous types of seating arrangements available to choose from, including rows and columns, groups, semi-circles, and pairs. However, there is little to guide teachers in their selection of an arrangement, as the experimental research in this area is sparse and contains methodological limitations. As noted by Marx, Fuhrer, and Hartig (1999), there is little research in general examining the physical aspects of the classroom setting. Nevertheless, this is an important consideration because the physical arrangement of the classroom can contribute to appropriate behaviors, disruptive behaviors, and overall academic achievement (Wannarka & Ruhl, 2008).

When deciding which arrangement to use in the classroom, a review of the available research in this area suggests that teachers should allow the nature of the task to guide the selection of the seating arrangement (Wannarka & Ruhl, 2008). For instance, two studies support the notion that when students are expected to interact with others (e.g., group assignments, class discussions), group seating is associated with more academic engagement than seating arrangements in which desks are isolated from one another. Rosenfield, Lambert, and Black (1985) compared on- and off- task behavior during a class brainstorming exercise in fifth and sixth grade students seated in traditional rows and columns, clusters (i.e., groups of up to eight desks), or a circle (i.e., all desks formed one large circle). Three classes served as controls and experienced one of the three seating arrangements throughout the study. Three different classes served as the experimental classes and experienced all three seating arrangements. Eight students in each class were selected as target students. Results showed that students displayed more on-task behavior (defined as participating in the discussion) when in the circle arrangement than when seated in rows or clusters. The authors concluded that circular seating facilitates social interactions and controls for off-task behavior when the goal of the activity is to increase

participation in a discussion. However, the findings of this study are limited due to the small number of observations for the control classes compared to the experimental classes. The control classes were only observed at the beginning of the study, while the experimental classes were observed throughout the entire study; therefore, it is impossible to determine how the control classes performed during the middle and end of the study compared to the experimental classes. This adversely impacts the internal validity of the study since there is no way to account for extraneous factors that may have influenced the results.

In a similar study by Marx et al. (1999), researchers examined the effects of the traditional row and column and semi circle (i.e., all desks formed a half circle) arrangements on student participation during a teacher directed lesson in a single class of fourth graders. Prior to the study, students were seated in tables, which consisted of two desks grouped together. The target behavior of interest was question asking. Results indicated that students asked more questions when seated in the semi circle arrangement than when seated in rows, which supported their hypothesis that interactive behaviors, such as question asking, are more likely to occur when seated in circular arrangements. However, the generalizability of the study is limited due to the small sample and lack of replication with additional, novel classes.

For tasks in which students are expected to work independently, several studies support the use of rows, as this is associated with lower levels of disruptive behavior and higher levels of academic engagement (Wannarka & Ruhl, 2008). For example, Axelrod, Hall, and Tams (1979) compared the on-task behavior of students when seated in tables or rows during an independent study activity. The first study employed a reversal design, in which one class of second grade students experienced tables, rows, tables again, then rows again. Tables consisted of groups of four or five desks. To form rows, the desks in each group formed a row. During the activity, the

class was instructed to work independently at their desk and raise their hands once finished so the teacher could check their answers. Appropriate study behavior was defined by a combination of behaviors, including looking at the instructional material, looking at the teacher when speaking, following directions, raising hand for assistance, and remaining seated. Results revealed that students engaged in a higher level of study behavior during both row conditions than the table conditions. The second study included a class of seventh grade students exposed to tables, rows, then tables again. Tables consisted of groups of eight desks, which was the arrangement in effect prior to the study. Rows were assigned in the same manner as the first study. The effects of each arrangement on disruptive behavior (i.e., talking without permission) were measured during independent seatwork. Results revealed significantly less disruptive behavior when seated in rows than when seated in tables. The authors concluded that the row formation is superior to grouped seating for independent tasks because there are reduced opportunities to interact with peers and misbehavior is more likely to be noticed by the teacher when desks are not clustered together. They also called for future research examining how differing amounts of grouped desks affects behavior, as a higher number of grouped desks would likely result in more inappropriate behavior. While these two experiments appear to support the notion that row seating is preferable for independent academic work, the results are limited due to the small sample of participants in each study. Another limitation involves the increasing trends in baseline during the first experiment, indicative of improving student behavior during the table arrangement immediately prior to transitioning to rows. This makes it difficult to determine if it was the row arrangement that improved on-task behavior or some other, unmeasured variable. A final limitation is the lack of a replication for the row condition in the second study.

Similarly, Wheldall, Morris, Vaughan, and Ng (1981) conducted two studies to compare the on-task behavior of students when seated in rows versus tables during independent seatwork. Both studies included a single class of ten- and eleven-year-old students that were normally seated in a table arrangement. Each class was exposed to two weeks of table seating, two weeks of row seating, then two weeks of tables again. For both studies, tables consisted of groups of four or five desks; however, the row arrangement differed across studies. In the first study, the row arrangement consisted of two desks paired together and placed into rows, whereas in the second study, some children were paired together while some children sat alone in rows. Teachers were allowed to determine student placement during the row arrangement. On-task behavior in both studies was defined as following directions, making eye contact with teacher when requested, and making eye contact with work materials when instructed to work. Disruptive, or off-task behavior, was defined as talking without permission, being out of seat, and not following directions or working on the assignment. Results showed that on-task behavior for both classes was 15% higher when students were seated in rows as opposed to tables. Researchers then analyzed student data based on initial levels of on-task behavior (e.g., high, medium, or low) and found that on-task behavior showed the greatest increases for students with low initial levels, with little change evident for students with high initial levels. They reasoned that the classroom seating arrangement serves as a setting event for various types of pupil and teacher behaviors, with rows associated with more on-task, independent work behaviors and tables associated with more interactive behaviors. However, it is difficult to interpret these findings due to flaws in the design. Many of the graphs are difficult to interpret due to the obvious trends in baseline, indicative of improving student behavior during the baseline conditions. The fact that neither study included a second row condition also makes it difficult to

interpret these findings, as there were no opportunities to replicate the effects of the row condition. The small sample size also limits the generalizability of the studies. Finally, it is difficult to compare these experiments to others of its kind since the row arrangement was actually a paired arrangement and not a traditional row and column design.

Wheldall and Lam (1987) later replicated this study in a school for adolescents with emotional, behavioral, or learning disorders. Three classes of 12- to 15-year-old students participated in the study and were exposed to tables and rows in a reversal design. The typical arrangement for each class was the table arrangement in which students could select where to sit. The math classroom at the school was designated as the experimental setting in which students experienced either tables or rows, while the English classroom served as the control setting in which the typical table arrangement remained in effect. For each class, they measured student on-task behavior, rate of disruptions, and rates of teacher approval and disapproval. Teacher approval was defined as verbal praise statements, nodding, smiling, patting on shoulder, and granting of privileges, whereas disapproval was defined as verbal criticism, reprimands, frowning, withdrawal of privileges, and physical punishment. Disruptive behavior was defined as talking out, noise making, desk banging, turning around, being out of seat, and aggressive acts. On-task behaviors included orientation towards academic material, engagement with academic work, orientation towards the teacher, eye contact with teacher, following directions, and remaining seated. In all three classes, they observed higher on-task behaviors in the row arrangement compared to seating in tables. The rate of disruptive behavior was three times higher in the table condition than in the row condition. Additionally, the row arrangement was associated with higher positive comments from the teacher and less negative comments compared to the table arrangement. While the lack of trends in the baseline phases make the data

more convincing than the Wheldall et al. (1981) experiment, the results remain questionable. The effects of each arrangement on the experimental setting are clearly demonstrated; however, the comparison between the experimental setting and control setting is not easily made due to the unequal number of observations across settings and the fact that observations for each setting were conducted on different days throughout the study. This compromises the internal validity of the study since it is impossible to conclude that behavior within each setting was not influenced by outside variables.

Hastings and Schweiso (1995) compared the on-task behavior of two elementary school classes aged nine to eleven when seated in rows versus groups to test for novelty effects of the seating arrangements. Previous research had not ruled out the possibility that the novelty of a new seating arrangement could account for the changes in student behavior. Therefore, researchers placed students in groups then rows or rows then groups and measured on-task behavior during an independent work activity. Neither of the included classes had previously used a row or group arrangement for independent seatwork; therefore, both seating arrangements were novel to students. Nonetheless, student on-task behavior was higher when seated in the row arrangement, consistent with previous research that the row arrangement is better for independent tasks. A second study by Hasting and Schweiso (1995) compared row and group seating with a classroom of 7- to 8-year-old students using an AB design. The class originally sat in five groups in which students were allowed to choose their seat and change seats throughout the lesson. When the class transitioned to rows, the teacher assigned students to a seat and changing seats was not permitted. Results showed that the row design was associated with increases in class on-task behavior. In the three target students, there were also notable increases in on-task behavior as well as decreases in disruptive behavior. However, the results of this study

are limited due to the nature of the design (i.e., lack of reversal or replication) and the fact that students could choose their seats during the group arrangement, but not during the row arrangement.

In the only study of its kind, Bennett and Blundell (1983) compared work quality and quantity in two classes of 10- and 11-year-old students when seated in either rows or groups. Both classes typically sat in a group arrangement, which consisted of groups of six desks (one group of four). Both classes transitioned from groups to rows (i.e., four rows of desks) then back to groups, with each period lasting two weeks. Work quality and quantity were analyzed across math, reading, and language. Work quantity was measured by counting the number of questions or work cards attempted for each subject, whereas quality was measured by calculating the percentage of problems answered correctly. While the quality of work remained the same despite seating arrangements, the amount of work produced in all subject areas was significantly higher when class transitioned to the row arrangement. This suggests that while the row arrangement is superior for increasing on-task behaviors, it is not sufficient to increase the level of academic performance.

In sum, the available research in this area appears to support the idea that student behavior is influenced by the physical arrangement of the classroom. Overall, this research suggests that the seating arrangement should change as the academic tasks changes so that the arrangement is consistent with the goals of the activity. For example, desks should be arranged in rows for independent work and desks should be moved to groups for group-related activities. However, many teachers do not change the desk arrangement throughout the school day, despite the many transitions from independent work to group-oriented activities. In elementary schools specifically, there appears to be an incompatibility between the seating arrangements used and

the nature of student tasks. The majority of academic tasks in the classroom are independent tasks (Hastings & Schweiso, 1995), meaning students are expected to work quietly and individually. However, many teachers continue to use only table or group seating arrangements, which may be contributing unnecessarily to disruptive behavior problems.

Altering the classroom seating arrangement is a simple way to change the physical aspects of the learning environment to improve classroom management and student behavior. This change can be easily accomplished by teachers and has the potential to largely decrease disruptive behavior problems (Kern & Clemens, 2007). For example, when the goal of an activity is to complete work independently and quietly, desks should be arranged in a manner that promotes these behaviors and discourages other behaviors. When desks are arranged in traditional rows and columns instead of groups or tables, students experience less proximity to their neighbor, and naturally, there are less opportunities to interact with one another or engage in disruptive behavior. Thus, altering the seating arrangement can be considered an antecedent intervention, because the triggers that may contribute to disruptive behaviors (i.e., peer proximity) have been removed or lessened, and therefore disruptive behaviors are less likely to occur.

Unfortunately, the available research on classroom seating arrangements appears to be somewhat limited in many ways. A general lack of research exists examining the impact of seating arrangements on disruptive classroom behavior. Few studies on seating arrangements have been conducted despite the increasing need to identify effective strategies to prevent disruptive behaviors in educational settings. A review by Wannarka and Ruhl (2008) revealed only nine published studies over the last three decades that involved an empirical investigation of different classroom seating arrangements. Yet, the desk arrangement in the classroom has the

potential to dramatically affect behavior and learning (Marx et al., 1999; Wannarka & Ruhl, 2008) and should be given due consideration as an antecedent strategy. Additionally, some of the existing studies in this area have design limitations that impact the ability to interpret the results with confidence. The generalizability of these studies is also limited due to the low number of studies using lower elementary aged participants. Because the majority of these studies included a sample of adolescent or upper elementary students, it is difficult to determine the impact of different seating arrangements on the behavior of lower elementary students.

Another limitation of this research is the low number of studies examining seating arrangements other than rows or tables. For example, almost all of the studies in this area have compared the effects of a group arrangement to the traditional row and column arrangement. Only two of the above studies have examined the effects of paired seating on disruptive behavior (Marx et al., 1999; Wheldall et al., 1981), and these arrangements were actually referred to as a table arrangement and a row arrangement in the study. It is possible that seating in pairs would allow for peers to sit in close proximity to one another (to complete partner-work) while still reducing the opportunities to engage in disruptive behavior presented by group or table seating. However, one cannot determine how the paired arrangement would compare to the row arrangement. Therefore, this seating arrangement merits additional research.

A final limitation is the lack of research comparing seating arrangements to alternative behavior management strategies. To this author's knowledge, there are no experimental studies examining the effects of seating arrangements as an antecedent strategy to a behavioral intervention, such as the Good Behavior Game. The Good Behavior Game represents a contingency-based intervention with indisputable positive effects on classroom management and disruptive behavior. Although antecedent strategies in general are widely supported, they are not

always sufficient to tackle all behavioral concerns, and some behaviors may merit additional supports or consequence-based interventions, like the Good Behavior Game. Kern and Clemens (2007) note that it is almost always more effective to combine antecedent interventions with other intervention approaches. Therefore, it is possible that altering the seating arrangement may reduce disruptive behaviors, but not to the degree that could be accomplished with the addition of a robust behavioral intervention.

Purpose of Current Study

The purpose of the current study was to expand the research in the area of classroom seating arrangements by addressing each of the aforementioned limitations. The first study compared three different seating arrangements in lower elementary classes during independent work activities to determine which resulted in the lowest levels of disruptive classroom behavior. The seating arrangements examined included a traditional row and column arrangement, a group arrangement of desks, and seating in pairs. Data were collected on the rate of disruptive classroom behavior and compared across arrangements by employing a multi-element single case design. The second study compared three conditions to determine if a simple antecedent strategy - changing the desk arrangement - could significantly decrease disruptive behaviors to the same degree as a reinforcement-based intervention (i.e., the Good Behavior Games). The effects of row seating and the Good Behavior Game together were also examined to explore the notion presented by Kern and Clemens (2007) – a combination of antecedent strategies and other intervention approaches usually produce the best results. After establishing a baseline level, data were collected on the rate of disruptive classroom behavior and compared across the three conditions by employing a multi-element single case design.

STUDY 1 METHODOLOGY

Participants

Four general education elementary classrooms from public schools in southeastern Louisiana participated in the study. Classes were referred by school administration or teachers for exhibiting disruptive behavior problems. All classes currently used a seating arrangement in which students were seated in groups, which served as a baseline of current class behavior. Mrs. Clark's 1st grade class consisted of 22 students and the behaviors targeted were speaking without permission and being out of one's seat without permission. Mrs. Dallas' 2nd grade class consisted of 20 students and the behavior targeted was speaking without permission. Mrs. Heather's 2nd grade class consisted of 23 students and the behavior targeted was speaking without permission. Finally, Mrs. Wilson's 3rd grade class consisted of 24 students and speaking without permission and being out of one's seat without permission were the behaviors targeted.

Procedure

After consenting to participate, teachers nominated periods of independent seatwork throughout the day (e.g., morning work) in which students engaged in the most disruptive behaviors. Independent seatwork was defined as a period of time in which each student was expected to complete a task individually at their desk without collaboration from other students and with minimal teacher assistance. Teachers were encouraged to choose activities that lasted approximately 10-20 minutes. Teachers listed several independent activities that were separated by natural breaks in the class schedule so there was an opportunity to rearrange desks between sessions. Each teacher also indicated the most problematic disruptive behavior(s) occurring during independent work times that violated the existing classroom rules. These behavior(s) were measured each observation. For all classes, "talking without permission" was nominated as a

behavior of concern and was operationally defined as shouting out to the teacher, talking/whispering to peers, talking/whispering to oneself, or making any other type of verbalization without teacher permission. For two classes, “being out of one’s seat without permission” was also nominated as a behavior of concern and was defined as walking away from one’s desk to ask the teacher a question, throw away trash, get materials, etc. without receiving permission from the teacher.

Prior to each session, the desks had been moved into one of the three arrangements described below. The teacher gave directions for an independent work activity, and the observation began. The researcher(s) observed the class for the entirety of the independent work period. The behavior of the whole class was observed by continuously scanning the classroom and recording each instance of disruptive behavior with tally marks on a recording form. All tally marks contributed to the total count of disruptive behaviors for each class. Individual student behavior was not assessed. The teacher was instructed to use the typical classroom management procedures currently in place, as the goal of this study was to determine if simply altering the seating arrangement resulted in changes in whole-class behavior.

Group Seating Arrangement. The teacher maintained the current seating arrangement in place in the classroom. Group seating was defined as an arrangement in which groups of three or more desks were pushed together, and there were multiple groups arranged throughout the classroom.

Row Seating Arrangement. Desks were arranged in a traditional row and column pattern. Each desk was evenly spaced from the surrounding desks and no two desks were touching. Teachers assigned students to positions in this arrangement alphabetically. Desks were arranged in this formation prior to the independent work activity and they remained in this

formation until the next natural break in the classroom schedule, at which point desks were moved to the next scheduled arrangement.

Pair Seating Arrangement. During this phase, desks were arranged in a paired formation, which consisted of two desks pushed together, one beside the other, which was also assigned based on alphabetical order. The pairs of desks were then placed into rows throughout the classroom. Desks were arranged in this formation prior to the independent work activity and remained in this formation until the next natural break in the classroom schedule, at which point desks were moved into the next scheduled arrangement.

Experimental Design and Data Analysis

The study used a single subject, multi-element design with each class serving as one subject. The group seating arrangement served as the baseline condition and the row arrangement and pair arrangement were the independent variables. Instances of disruptive behavior served as the dependent variable. Data on the occurrence of disruptive behaviors were recorded and graphed as a rate of behavior and analyzed using visual analysis of graphed data.

Prior to beginning an independent activity, the desks were arranged in either group, row, or paired seating. The order in which seating arrangements were presented to each class was randomized across sessions so that every arrangement occurred at least once during each independent activity, and every arrangement occurred at least five times.

Inter-Observer Agreement

Inter-observer agreement (IOA) was collected for approximately 25% of sessions. A second researcher observed the class and recorded each instance of disruptive behavior using the same observation method as the first observer. IOA was calculated by dividing the total count of

disruptive behaviors from one observer with the total count from the second observer, and then multiplying by 100 to yield a percentage. Average IOA was 88% across sessions.

Treatment Integrity

Treatment integrity was recorded each session and assessed whether the class was seated in the appropriate arrangement for that session and if independent seatwork was assigned. An observation of a session did not begin until these two criteria were satisfied. Therefore, treatment integrity was 100%.

STUDY 1 RESULTS

As depicted in Figure 1, there was a high degree of variability in rates of disruptive behavior across conditions. All classes displayed the highest rates of disruptive behavior in the group seating arrangement. Although little variability existed for Mrs. Wilson's class, the highest rates of disruptions were still observed in the group arrangement. Row and pair arrangements were both associated with lower rates of disruptive behavior, with negligible differences between the two conditions. For all classes except Mrs. Clark's class, the lowest measure of disruptive behavior occurred with the row arrangement. For all classes except Mrs. Wilson's class, rates of disruptions were on average twice as high in the group arrangement than in rows and pairs.

Using visual analysis, it was unclear if the row or pair arrangement was most effective. Therefore, three single case design statistics (Parker & Vannest, 2009) were calculated to numerically measure the effects of these arrangements. Percentage of Non-overlapping Data (PND) measures the percentage of data points in a treatment phase that exceed the lowest baseline data point, as the goal was to *decrease* the measured variable (i.e., disruptive behavior). Percentage of All Non-overlapping Data (PAND) finds the smallest number of data points from either the baseline or treatment phase whose elimination would result in completely non-overlapping data amongst the phases. To calculate the Standardized Mean Difference (SMD), the mean of baseline is subtracted from the mean of treatment, then divided by the standard deviation of baseline. An effect size is generated, with 0.2 representing a small treatment effect, 0.5 a moderate effect, and 0.8 representing a large effect (Cohen, 1988). Table 1 details the results of each statistic. PAND and SMD statistics showed a slight advantage for rows, while PND resulted in a greater effect for rows compared to pairs.

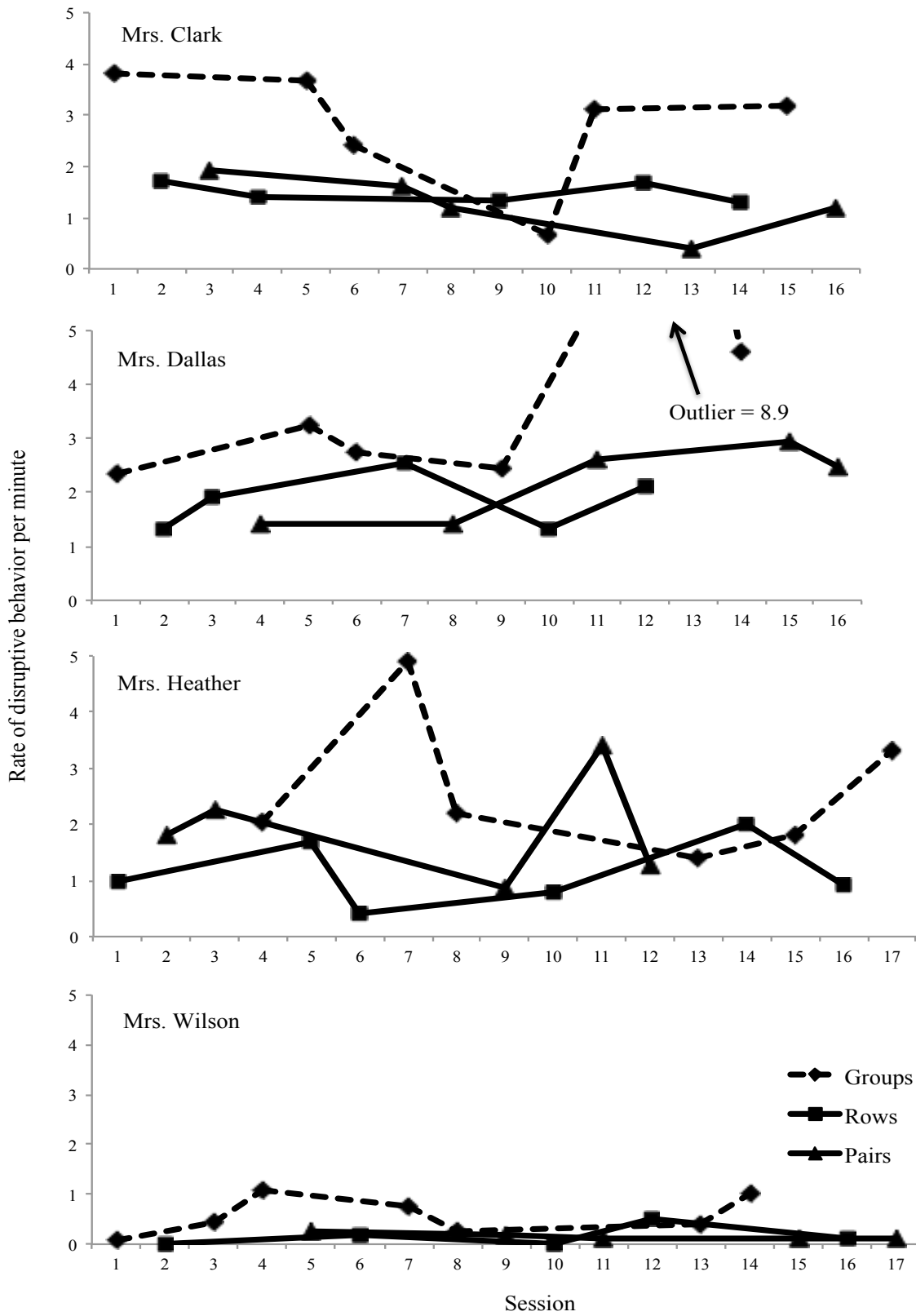


Figure 1. Rates of Disruptive Behavior Across the Group, Row, and Pair Seating Arrangements

In addition to visual analysis and single case design statistics, the researcher conducted a poll amongst a group of fellow researchers, which served as a measure of social validity. Peers were asked to analyze graphed data using visual analysis and indicate the most effective condition. Ten out of 11 peers (91%) indicated that the row arrangement resulted in the largest decreases in disruptive behaviors.

Table 1. Average Effect Sizes for Each Statistic for Rows and Pairs

	PND	PAND	SMD
Rows	50%	85%	1.07
Pairs	25%	80%	0.94

STUDY 2 METHODOLOGY

Participants

Four general education elementary classrooms from public schools in southeastern Louisiana participated in this study upon referral by school administration or teachers themselves for issues with disruptive classroom behavior. All classes currently used a group seating arrangement. Mrs. Ham's 3rd grade class consisted of 22 students and the behaviors targeted were speaking without permission and being out of one's seat without permission. Mrs. Sidney's 3rd grade class consisted of 23 students and the behavior targeted was speaking without permission. Mrs. Andrew's 1st grade class consisted of 17 students and the behavior targeted was speaking without permission. Finally, Mrs. Jewel's 1st grade class consisted of 22 students and speaking without permission was the behavior targeted.

Procedure

The procedure for this study was similar to Study 1. Teachers nominated periods of independent seatwork in which disruptive behaviors often occurred following the same guidelines used in Study 1. The operational definitions from Study 1 for the disruptive behaviors (talking out and out of seat) were used. The classroom observation method was identical to Study 1. However, the teacher was only instructed to use the typical classroom management procedures during the row condition. When the Good Behavior Game was in effect, the teacher was instructed to follow the steps of the intervention, which are described below.

Group Seating Arrangement. This was the baseline condition. The teacher maintained the current seating arrangement in place in the classroom. Group seating was defined in the same manner as Study 1.

Row Seating Arrangement. This condition was identical to Study 1. Desks were arranged in a traditional row and column pattern alphabetically.

Good Behavior Game (GBG). Prior to the implementation of the game, the class was divided into two teams based on alphabetical order. Team assignments and the game rules were posted in the classroom. Before the period of independent work began, the teacher reviewed the team assignments and game rules. The teacher then announced to the class that the game was starting. Throughout the game, any time a student broke one of the behavior rules, the teacher gave that student's team a mark on the board. When the period of independent seatwork ended, the teacher totaled the marks for each team, announced a winner, and rewarded the winning team. Rewards were determined by the teacher and included school PBIS tickets, candy, or small treats from a prize jar. The desks remained in the group seating arrangement during this condition, as the goal was to determine the effects solely of the game.

Rows + GBG. During this condition, desks were moved into the row arrangement *and* the Good Behavior Game was implemented in the same manner previously described.

Experimental Design and Data Analysis

Similar to Study 1, this study used a single subject design with each class serving as one subject. The group seating arrangement served as the baseline condition and the row arrangement and Good Behavior Game were the independent variables. Instances of disruptive behavior served as the dependent variable and data on the occurrence of disruptive behaviors were recorded and graphed as a rate of behavior and analyzed using visual analysis of graphed data.

After establishing a baseline, a multi-element design was used to analyze the effects of the row seating arrangement and the game on disruptive behavior during independent work activities. Prior to beginning an independent activity, the desks were arranged in either the row

or group arrangement, and depending on the condition, the Good Behavior Game was sometimes implemented as well. The order in which each condition occurred was randomized across sessions so that each occurred at least once during each independent activity, and each condition occurred at least five times.

Inter-Observer Agreement

Inter-observer agreement (IOA) was collected for approximately 20% of sessions in the same manner as Study 1. Average IOA was 85% across sessions.

Treatment Integrity

Treatment integrity assessed whether the class was seated in the appropriate arrangement for that session, if independent seatwork was assigned, and if the six aforementioned Good Behavior Game steps were all implemented (when applicable). Similar to Study 1, an observation of a session did not begin until the first two criteria were satisfied. Therefore, that aspect of treatment integrity was measured every session and was 100%. Good Behavior Game treatment integrity was assessed for 93% of sessions and measured the percentage of intervention steps that were completed. Average intervention integrity was 95%.

STUDY 2 RESULTS

Figure 2 displays the results for Study 2. Not surprisingly, all classes exhibited the highest rates of disruptive behavior in the baseline phase (i.e., group seating). All treatment conditions (rows, GBG, and rows + GBG) were associated with reductions in disruptive behavior. For all classes, the row arrangement produced less disruptive behavior than baseline levels. Some variability in the row condition was observed with Mrs. Ham's class, yet the row arrangement was clearly not the most effective condition for this class overall. Mrs. Jewel's class demonstrated little variability across the row + GBG and GBG conditions, but significant variability with the row arrangement, which eventually surpassed baseline levels of behavior. Little variability was observed for Mrs. Andrew's class and Mrs. Sidney's class, with a clear distinction between the row condition and conditions including the game.

For all classes, the greatest treatment effects were achieved when the Good Behavior Game was implemented, regardless of how the desks were arranged (in rows or groups). Again, some variability was observed across and within these conditions for Mrs. Ham's class, making it more difficult to determine if one condition resulted in superior effects, or if the two produced similar effects. For the other three classes, there were no significant differences in effect between the row + GBG and the GBG conditions using visual analysis.

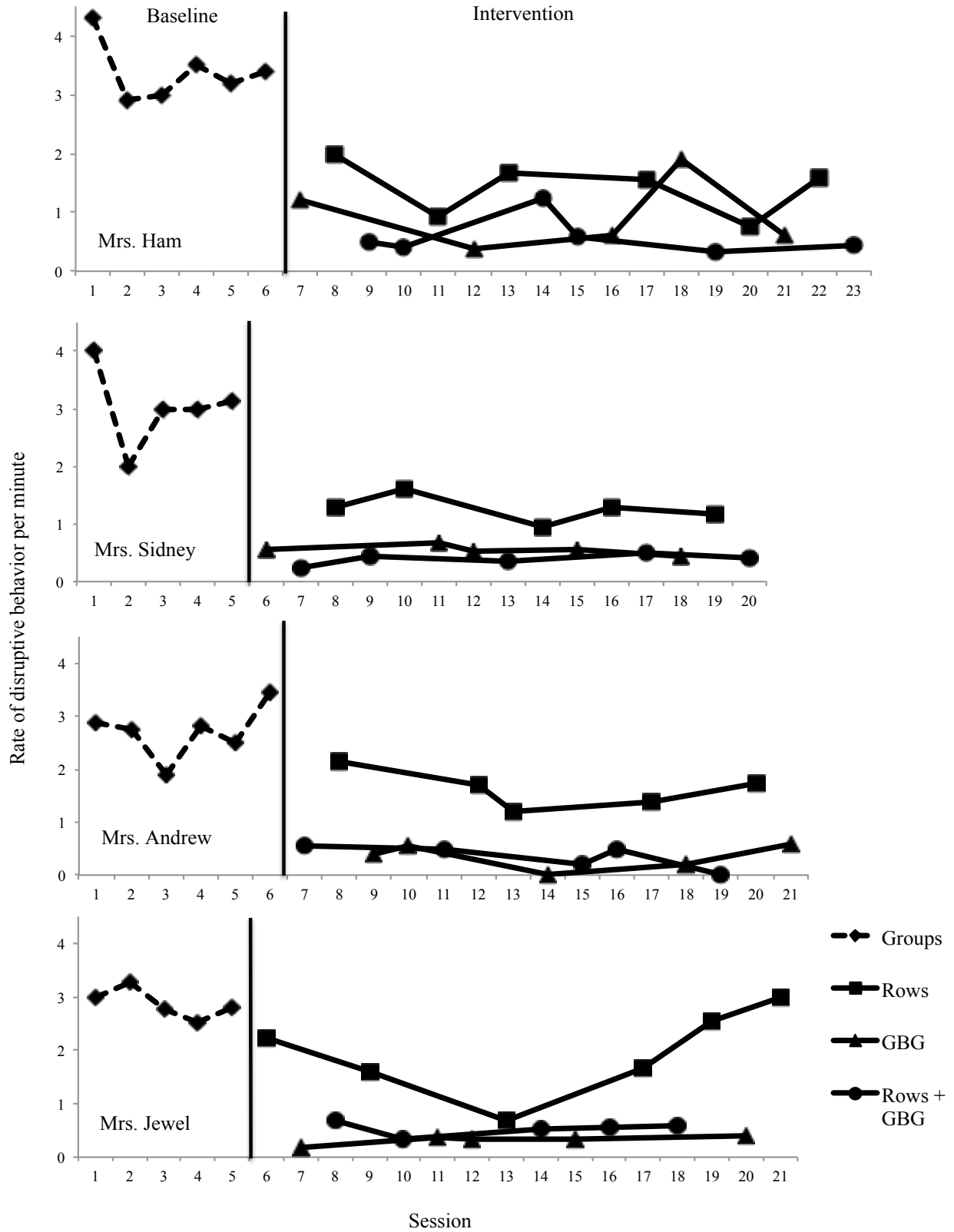


Figure 2. Rates of Disruptive Behavior Across Rows, GBG, and Rows + GBG Conditions

GENERAL DISCUSSION AND CONCLUSION

Results of Study 1 revealed that the group seating arrangement was associated with the highest rates of disruptive classroom behavior. Given the nature of group seating, this is not surprising since students are probably more likely to whisper or talk without permission when in close proximity to others. It may also be more difficult for the teacher to monitor and correct misbehavior when the desks face different directions and are grouped together, which could result in higher instances of disruptive behavior. Given previous research on classroom seating arrangements, it is not surprising that the row arrangement resulted in low levels of disruptive behavior. This effect is likely attributable to the fact that there are less opportunities to engage with peers when desks are isolated from one another, and students are less likely to become distracted by others or “off-task” when they have their own personal work space. Arguably, it may also be easier for the teacher to monitor student behavior when the desks are all facing the same direction and the teacher can walk between each desk. The least amount of research has been conducted on the pair arrangement; however, low levels of disruptions were also observed when desks were in pairs. Similar to rows, the effectiveness of the pair arrangement is probably attributable to the fact that opportunities for peer interactions are reduced and it is easier for the teacher to monitor behavior. It is unlikely that the effects of the row and pair arrangement are simply attributable to the novelty of a new seating arrangement. If this were the case, one would expect rates of behavior in rows and pair to eventually approach the level of behavior displayed during the group arrangement, as the students became accustomed to the new arrangements. However, this was not observed.

Three of the four classes recruited for Study 1 displayed generally high levels of disruptive behavior. Very low rates were observed for Mrs. Wilson’s class, even in the group

arrangement. Small differences were observed across different seating arrangements for Mrs. Wilson's class; however, these differences were too small to be of clinical significance. This suggests that Mrs. Wilson's typical classroom management strategies were probably sufficient at managing student behavior, and did not merit further intervention. All classes except Mrs. Wilson's also displayed a high degree of variability across conditions, which may be due to the variable nature of human behavior, the type of task that was assigned during each session (e.g., novel or preferred tasks), events occurring prior to the observation, or other unmeasured factors.

The results of Study 2 revealed that classes exhibited the lowest rates of disruptive behavior when the Good Behavior Game was in effect, regardless of how the desks were arranged. This is likely attributable to several factors. First, research has shown that effective classroom management involves establishing and teaching clear behavioral expectations, reinforcing rule following, and providing consequences for rule-breaking (Kern & Clemens, 2007). All of these components occur naturally when the game is implemented because the teacher establishes the behavior rules for the game, gives marks when students break a rule, and rewards the winning team. Secondly, the Good Behavior Game provides rewards for displaying appropriate classroom behavior, whereas simply sitting in a row arrangement does not. It is possible that students were more motivated to follow the classroom rules when the game was implemented since an immediate (and tangible) reward was available. Third, the game utilizes a group contingency in which members of a team are working towards a common goal and the reward is dependent on the behavior of the whole team. Based on a meta-analysis conducted by Stage and Quiroz (1997), the most effective classroom behavior interventions were those that used group contingencies. Given this previous research, it is not surprising that the best outcomes were observed with the Good Behavior Game.

There are several practical implications that arise when analyzing the results of the current studies. First, group seating was associated with the highest rates of disruptive behavior for all classes across both studies. Yet, many teachers continue to use group arrangements due to the emphasis placed on peer learning/collaboration by elementary curriculum programs. The available research in this area (although flawed) favors row or pair seating arrangements for independent work activities, and grouped arrangements for more collaborative activities. Wannarka and Ruhl (2008) suggest that teachers should allow the nature of the task to guide the selection of the seating arrangement. It stands to reason that if the goal of the activity is to work independently, then that is best accomplished by isolation from others; on the other hand, if the goal is collaboration with peers, an arrangement (such as groups) that promotes this type of interaction would be more suitable. Since there are usually more independent tasks than partner tasks assigned to elementary classes, teachers might utilize a row or pair arrangement for the majority of the day and move the desks together temporarily for group work.

Changing the seating arrangement from groups to a row or pair arrangement may also serve as an easy antecedent strategy for teachers who are interested in quickly decreasing disruptive behaviors, but resistant to using classroom behavioral interventions. While simply changing the desk arrangement may be effective for *reducing* behavioral problems, it is no substitute for routinely establishing, teaching, and reinforcing behavioral expectations. As a result, altering the seating arrangement may not be sufficient to fully restore classroom management.

Limitations and Future Research

The first limitation of the current study is the short duration. Data collection for each participating class was relatively short (two weeks, on average). It is possible that extended data

collection may have revealed changing trends or decreases in variability that was observed across conditions. For example, it is possible that the effectiveness of the Good Behavior Game or treatment integrity may have deteriorated after being implemented for a longer period of time. Also, more obvious differences in the row and pair arrangement may have emerged, as rates of behavior in each condition might have become more stable. Future research should examine the long-term effects of such conditions on student behavior.

A second limitation is that only 1-2 disruptive behaviors were measured for each class (i.e. talking without permission and leaving one's seat without permission). In reality, teachers are likely to report multiple disruptive behaviors that occur with a high frequency during independent work periods. Additionally, the current study only examined the effects of seating arrangements and the game during independent work periods. Future research might examine the effects of such on decreasing *multiple* problematic behaviors during a variety of classroom activities (e.g., teacher-directed lessons, group work).

A third limitation is that Ms. Wilson's class displayed minimal rates of disruptive behavior across conditions. The observed differences in effect across different seating arrangements were too low to be considered meaningful. Future studies might include screening criteria prior to participation in the study to avoid recruiting classes that do not display clinically significant levels of behavior.

Desks were arranged into the row and pair formations alphabetically to allow for standardization of study procedures. Future research might find even greater reductions in disruptive behavior if the teacher selects where students sit within these arrangements. This is more representative of how seating is assigned in a typical classroom and would give the teacher the freedom to consider individual personalities, amount of teacher supervision required, etc.

Previous research suggests that using a row arrangement may produce an increase in on-task behavior (Bennett & Blundell, 1983). Although this variable was not measured in the current study, this could provide more rationale for using a row arrangement. Future research should examine the effects of different seating arrangements on the quantity of work completed, since this aspect has not been fully explored.

In general, there appears to be limited research in the area of classroom seating arrangements, despite the potential impact it can have on student behavior. While previous research has demonstrated some general themes – the nature of the task should dictate the seating arrangement – it is flawed due to the lack of experimental control, small sample sizes, and lack of replication. Future researchers examining classroom environments, classroom management, and antecedent interventions may find seating arrangements a worthy topic. Although this study did not find altering the seating arrangement superior to a class-wide behavior intervention, the appropriate seating arrangement certainly has the potential to change student behavior.

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APPENDIX: IRB APPROVAL FORM

Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.



Institutional Review Board
 Dr. Robert Mathews, Chair
 130 David Boyd Hall
 Baton Rouge, LA 70803
 P: 225.578.8692
 F: 225.578.5983
irb@lsu.edu | lsu.edu/irb

– Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-F, listed below, when submitting to the IRB. Once the application is completed, please the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://sites01.lsu.edu/wp/ored/human-subjects-screening-committee-members/>

– A Complete Application Includes All of the Following:

- (A) A copy of this completed form and a copy of parts B thru F.
- (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
- (C) Copies of all instruments to be used.

*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.

- (D) The consent form that you will use in the study (see part 3 for more information.)
- (E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>)
- (F) IRB Security of Data Agreement: (<https://sites01.lsu.edu/wp/ored/files/2013/07/Security-of-Data-Agreement.pdf>)

1) **Principal Investigator:** **Rank:**

Dept: **Ph:** **E-mail:**

2) **Co Investigator(s):** please include department, rank, phone and e-mail for each

*If student, please identify and name supervising professor in this space

Department of Psychology
 Professor
 (225) 578-4663
frankgresham@yahoo.com

IRB# <i>E8630</i>	LSU Proposal # _____
<input checked="" type="checkbox"/>	Complete Application
<input checked="" type="checkbox"/>	Human Subjects Training
<input checked="" type="checkbox"/>	IRB Security of Data Agreement

3) **Project Title:**

STUDY EXEMPTED BY:

Dr. Robert C. Mathews, Chairman
 Institutional Review Board
 Louisiana State University
 130 David Boyd Hall
 225-578-8692 / www.lsu.edu/irb

Exemption Expires: *2/13/2014*

4) **Proposal? (yes or no)** **If Yes, LSU Proposal Number**

- Also, if YES, either
- This application completely matches the scope of work in the grant
- OR
- More IRB Applications will be filed later

5) **Subject pool** (e.g. Psychology students)

*Circle any "**vulnerable populations**" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) **PI Signature** **Date** (no per signatures)

**** I certify my responses are accurate and complete.** If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action: Exempted <input checked="" type="checkbox"/> Not Exempted _____	Category/Paragraph <u>1</u>
Signed Consent Waived?: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Reviewer <i>Mathews</i>	Signature <i>Robert Mathews</i> Date <i>2/13/14</i>

VITA

Natalie Robichaux is currently employed as a school psychologist for the Tangipahoa Parish School System in Louisiana. She graduated from Louisiana State University with a Bachelor of Science degree in psychology in 2010 and earned a Master of Arts degree in psychology in 2012. She is pursuing the Doctor of Philosophy degree in the school psychology program at Louisiana State University. Natalie's research is conducted under the supervision of Frank M. Gresham, Ph.D.