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Evaluating the Effects of a Teacher-Implemented Mindfulness-Based Intervention on Teacher Stress and Student Prosocial Behavior

Mary L. Phan
Utah State University

EVALUATING THE EFFECTS OF A TEACHER-IMPLEMENTED MINDFULNESS-

BASED INTERVENTION ON TEACHER STRESS AND STUDENT PROSOCIAL

BEHAVIOR

by

Mary L. Phan

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Approved:

_____	_____
Tyler L. Renshaw, Ph.D	Maryellen McClain Verdoes, Ph.D
Major Professor	Committee Member
_____	_____
Melanie M. Domenech Rodríguez, Ph.D	D. Richard Cutler, Ph.D
Committee Member	Vice Provost of Graduate Studies

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ABSTRACT

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Mary L. Phan, Master of Science

Utah State University, 2023

Major Professor: Tyler Renshaw, PhD
Department: Psychology

High levels of teacher stress have a negative impact on teacher performance,
maintenance, and student outcomes. Given the escalation in teacher stress levels, it is
important to decrease teacher stress to improve their wellbeing. One intervention that has
received growing attention in reducing teacher stress is mindfulness training. When
teachers use mindfulness, results have shown increased social-emotional competence and
reduced emotional exhaustion, stress, and burnout. Few studies have focused on teachers
implementing mindfulness-based interventions (MBIs) both with themselves and with
school-age children within their classrooms. Additionally, few studies have examined the
fidelity, feasibility, and social validity of teacher-implemented MBIs in a classroom
setting. As a result, it is important to know if MBIs are effective and acceptable enough
for teachers to maintain long-term improvements on student outcomes. This study aimed
to fill gaps in the current literature by investigating a simple protocol for supporting
teachers in self- and classroom-implementation of MBI. The aims of this study were to
(a) evaluate whether there is a functional relationship between an MBI consisting of self-

practice and classroom-based implementation with teacher stress; (b) examine whether there is a functional relationship between this MBI and student prosocial behavior; (c) evaluate the extent to which cultural adaptations to this MBI are socially valid for teachers; and (d) explore teacher fidelity related to MBI implementation. Results indicated that the MBI seemed to decrease teacher stress for 2 of the 4 teachers and improved coping abilities for 2 of 4 teachers. In addition, the MBI had small yet desirable effects on students' academic engagement, respectful behavior, and disruptive behavior in the classroom. Teacher reports suggest that MBI self-practice and classroom-based implementation were conducted with high fidelity and had strong socially validity.

(106 pages)

PUBLIC ABSTRACT

EVALUATING THE EFFECTS OF A TEACHER-IMPLEMENTED MINDFULNESS-BASED INTERVENTION ON TEACHER STRESS AND STUDENT PROSOCIAL BEHAVIOR

Mary L. Phan

High levels of teacher stress have a negative impact on teacher performance, maintenance, and student outcomes. Given the escalation in teacher stress levels, it is important to decrease teacher stress to improve their wellbeing. One intervention that has received growing attention in reducing teacher stress is mindfulness training. However, few studies have focused on teachers implementing mindfulness-based interventions (MBIs) both with themselves and with school-age children within their classrooms. Additionally, few studies have examined the fidelity, feasibility, and social validity of teacher-implemented MBIs in a classroom setting. Through a single-case multiple baseline design across four teachers, the current study evaluated the effects of an MBI consisting of self-practice and classroom-based implementation on teacher stress and students' classroom behavior. The study also explored implementation fidelity and whether cultural adaptations to this MBI were socially valid for teachers. Results indicated that the MBI seemed to decrease teacher stress for 2 of the 4 teachers and improved coping abilities for 2 of 4 teachers. In addition, the MBI had small yet desirable effects on students' academic engagement, respectful behavior, and disruptive behavior in the classroom. Teacher reports suggest that MBI self-practice and classroom-based implementation were conducted with high fidelity and had strong socially validity.

Results have practical implications for informing future research related to using MBI to

reduce teacher stress and improve students' classroom behavior.

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CHAPTER I

INTRODUCTION

Teacher stress has increased throughout the years as educators are faced with increasing challenges and unreasonable expectations in schools (Greenberg et al., 2016). Challenges teachers face in schools may include large class sizes (Horng, 2009), students facing food insecurity (Fiese et al., 2011), and major curricular changes that are not met with sufficient resources or professional development (Ajayi, 2016). Across grade levels, high-stakes testing and associated accountability policies contribute to negative psychosocial outcomes for teachers, including increased stress and attrition as well as decreased motivation and morale (Clotfelter et al., 2004; Collie et al., 2012; Pishghadam et al., 2014; Saeki et al., 2018; Tadić et al., 2013; von der Embse & Putwain, 2015). Interestingly, lower-grade teachers at the elementary level tend to perceive the workplace as extremely stressful compared to upper-grade teachers (18.5% vs. 5.45%; Agai-Demjaha et al., 2015). As a result of the multiple stressors in their daily work, teachers facing chronic stress may experience reduced job effectiveness and burnout (Jennings & Greenberg, 2009; MacDonald & Shirley, 2009).

Chronic stressors may also influence teacher–student relationships (Yoon, 2002). For example, students who tend to be more disruptive, aggressive, and resistant are especially challenging to teachers and have been noted as a significant source of stress (Boyle et al., 1995). These student externalizing behaviors have been negatively correlated with the quality of teacher–student relationships, which could lead to students' negative school attitude, school avoidance, and hostile aggression (Birch & Ladd, 1997; Howes et al., 1994; Pianta & Steinberg, 1992). As a result, students are more likely to

have a negative perception of the teacher, their feelings toward their teacher, and their behavior in the classroom (Shen et al., 2015). These stressors that students experience in the classroom may have an impact on the brain structures related to cognition and mental health (Aherne, 2001; Card & Hodges, 2008; Lupien et al., 2009). In a classroom setting, students' academic-related stressors include examinations, time demands, competition, and class environment while personal stressors are a result of intimate relationships, finance, and parental conflict (Murphy & Archer, 1996). Studies have shown that experiencing academic stress affects students' academic performance (Ofori & Charlton, 2002), their self-esteem (Lo, 2002), and the efficacy of their coping (Shipton, 2002), which can lead to adverse changes in physiological and psychological health (Aherne, 2001).

The teacher stressors mentioned above contribute to teaching being ranked as one of the highest professions in stress-related outcomes (from a database of 26 occupations; Johnson et al., 2005). Stress and burnout lead to teachers leaving the profession and increased rates of turnover in schools from year to year (Carver-Thomas & Darling-Hammond, 2019; Grant et al., 2019; Ryan et al., 2017). This is especially problematic for marginalized and minoritized students, as turnover rates are 70% higher for teachers in schools serving students of color (Carver-Thomas & Darling-Hammond, 2017, 2019). Furthermore, teacher burnout and stress have also been shown to negatively influence student well-being (Geving, 2007). Specifically, Geving (2007) found a bidirectional relationship between teacher stress and student well-being in which stressed teachers elicited negative student behaviors (e.g., harming school property, criticizing other students, and talking back to the teacher). Research also found that teacher burnout was

associated with higher levels of student antisocial and oppositional/defiant behaviors (e.g., cruelty/bullying, rudeness, deceiving or making fun of classmates; Kokkinos, 2007).

In addition to negative student behaviors, student stress in the classroom resulting from teacher stress has been associated with anxiety, depression, and lower well-being, which in turn could affect academic achievement (Bernal-Morales et al., 2015; Carter et al., 2006; Moylan et al., 2013). Relatedly, a national survey found that mental health issues, such as depression, decrease if students have positive adjustments to academic life and social support (Ross & Mirowsky, 2006). Given teachers' escalated stress levels and the negative impact chronic stress has on teacher performance and maintenance, it is important to decrease teacher stress and improve their wellbeing. Furthermore, directly addressing teacher stress may indirectly improve the stress of young students and thereby their mental health (Pascoe et al., 2020).

With the growing interest in reducing stress for teachers, there have been several interventions developed that integrate behavioral and cognitive approaches to reduce teacher stress (Beck, 1979; Jeffcoat & Hayes, 2012). A systematic review examined four major categories of teacher stress interventions, which included knowledge-based, behavioral, cognitive-behavioral, and mindfulness methods (von der Embse et al., 2019). In this review, 64 experimental and quasi-experimental studies were identified. The authors concluded that implementation of consistent, regular, and applied interventions 8–10 weeks in duration, with regular weekly meetings from 60–90 minutes, seemed necessary to obtain positive outcomes. Most treatment types reported small ($d < 0.20$) to medium ($d < 0.50$) effect sizes, regardless of intervention type. Results indicated that the

most effective interventions were in the mindfulness, behavioral, and cognitive-behavioral domains, and that interventions delivered only on informational content were found to be the least effective. In addition to these effective interventions targeting teacher stress directly, additional research suggests classroom management training may reduce teacher stress indirectly by preventing or improving some causes of stress from student behavior problems (Dicke et al., 2015; Eddy et al., 2019).

Mindfulness Training with Teachers

As a resource for self-regulating emotions, one intervention that has received growing attention for reducing teacher stress is mindfulness training. Mindfulness is defined as a process by which people "pay attention in a particular way: on purpose, in the present moment and nonjudgmentally" (Kabat-Zinn, 2003, p. 145). Mindfulness-based intervention (MBI) has been found to improve stress regulation and its underlying physiology in adults (Forkmann et al., 2014; Roeser, 2014). Mindfulness involves self-regulation of attention and nonjudgmental awareness. Self-regulation of attention allows for metacognitive awareness of one's emotional and cognitive experience as it occurs. This meta-awareness, combined with nonjudgmental awareness, supports emotional and cognitive self-regulation (Jennings et al., 2011). As such, mindfulness enhances self-regulatory processes that buffer against psychological distress (Jimenez et al., 2010). Given MBIs promote flexibility and self-regulation, they may help teachers overcome the tendency to make automatic, reactive appraisals of student behavior that contribute to stress. Therefore, teachers who develop greater mindfulness may have increased stress regulation and classroom management (Chang, 2009).

When teachers learn and use mindfulness, they show increased social-emotional competence and reduced emotional exhaustion, stress, and burnout (Klingbeil & Renshaw, 2018; von der Embse et al., 2019). Furthermore, there is correlational evidence showing that mindfulness and its mechanisms of change, such as emotional regulation, are linked to decreased teacher stress and burnout (Abenavoli et al., 2013). Several studies have now shown that providing teachers with mindfulness training could result in improvements in mindfulness, emotional regulation and self-compassion, as well as reduced distress and improved wellbeing (Jennings & Greenberg, 2009; Roeser et al., 2012). In developing mindfulness skills, teachers may experience increased resilience, work engagement, and prosocial dispositions. As a result, there is growing evidence that MBIs can increase teachers' well-being and may enhance their ability to cope with the high-stress load and emotional demands of teaching (Hwang et al., 2017).

In addition to using MBI with teachers directly, research has also explored teachers' ability to implement MBI with students. One study has shown that mindfulness interventions conducted in classrooms by teachers have more consistent and positive effects for students compared to mindfulness interventions conducted by other instructors. Specifically, in a systematic review conducted by Waters et al. (2015), evidence from 15 peer-reviewed studies of school meditation programs demonstrated that MBIs were more efficacious when teachers delivered the intervention compared to non-teachers (e.g., researchers, psychologists, meditation practitioners). However, a meta-analysis conducted by Klingbeil et al. (2017) looking at 76 studies found no difference in outcomes when teachers or non-teachers administered the mindfulness intervention. More recently, a qualitative study examining a teacher-led mindfulness program found that

teachers reported high acceptability of MBIs and that students were calmer and more relaxed as a result of the program (King et al., 2021).

To date, there have been several comprehensive research syntheses exploring the impact of MBIs with teachers. According to Emerson et al. (2017), who examined 13 peer-reviewed studies looking at the utility of MBIs in boosting teachers' skills of emotion regulation and perceived self-efficacy, MBIs could be potentially useful as a stress reduction technique for teachers. Effect sizes of teachers' skill of emotion regulation ranged from medium-to-large ($d = 0.50$–0.80) whereas effects on their perceived self-efficacy ranged from small to large ($d = 0.20$–0.80). Hwang et al. (2017) examined 16 peer-reviewed studies that investigated the impact of mindfulness on self-efficacy and self-compassion while also looking at teachers' improvements in psychological stress (e.g., depression and anxiety symptoms). Findings from this review suggested that MBIs produced improvements in teacher functioning (e.g., managing conflict in classrooms) and wellbeing (e.g., increased resilience, emotion regulation) with effect sizes ranging from small-to-large ($d = 0.20$–0.80).

Another systematic review by Lomas and colleagues (2017) found that in 19 peer-reviewed studies, MBIs had statistically significant improvements on short-term stress management and for enhancing teachers' long-term performance and coping (Lomas et al., 2017). A more recent, comprehensive meta-analysis conducted by Klingbeil and Renshaw (2018) showed that in 29 peer-reviewed studies, MBIs had an overall medium treatment effect for improving teachers' mindfulness, psychological wellbeing and distress, classroom practices, and theoretical mechanisms of change (e.g., emotional processing and regulation, sustained attention) that linked mindfulness practice to other

teacher behaviors and qualities. Taken together, these several research syntheses suggest MBIs can improve teachers' stress and wellbeing by enhancing their ability to be mindful.

Gaps in the Literature Regarding Mindfulness with Teachers

Although there have been dozens of studies showing the effectiveness of MBIs with teachers, there are several gaps in the literature. First, it is important to note that MBIs in schools can be *direct* (i.e., targeting teachers directly to improve their outcomes), *indirect* (i.e., targeting teachers to indirectly address student outcomes), or a combination of both (Meiklejohn et al., 2012). Several meta-analytic reviews provide evidence supporting the use of direct MBIs with teachers (e.g., Burton et al., 2017; Khoury et al., 2015; Virgili, 2015). However, there are fewer research studies focused on indirect MBIs with teachers, especially those showing the effects of teacher-implemented MBIs on school-age children in their classrooms (Caldwell et al., 2019). The practices incorporated in MBI with school-age children generally include psychoeducation about emotions and mindfulness, mindful awareness of breath, mindful body scans, and other experiential practices cultivating awareness of thoughts, feelings, and sensations, which are often delivered in the context of whole-class instruction (general population of students) or targeted intervention (at-risk populations of students; Kuyken et al., 2013; Raes et al., 2014). Research with *indirect* MBIs with teachers is important considering its ability to promote active learning, a process that requires teacher collaboration and personal understanding (Metzler, 2017).

Another gap in the literature is that there are no studies examining fidelity to teacher-implemented MBIs in a classroom setting. When new social, emotional, and

behavioral programs or practices are adopted in schools, only 25–50% are likely to be implemented with sufficient fidelity (Gottfredson & Gottfredson, 2002). The evaluation of intervention fidelity is important because this variable moderates the relationship between the intervention and its outcomes. In addition, the assessment of implementation fidelity could prevent potentially false conclusions from being drawn about the intervention's effectiveness (Carroll et al., 2007). It is also worth mentioning that the existing research measuring educator's fidelity with classroom interventions has not focused on CBT-based interventions, like MBIs, but rather on behavioral interventions targeting classroom management techniques. Nonetheless, we are generalizing the current literature to MBIs considering there are few studies looking at teacher implementation of CBT-based interventions in a classroom setting. Given that fidelity measurement allows teachers to maximize instructional effectiveness and for researchers to determine whether teacher practices are influencing student outcomes or if changes are needed, fidelity research is crucial in classroom settings.

Furthermore, there are no known studies that examine the nature of the dose-response relationship for MBIs with teachers, for both reducing teacher stress (direct effects) and for improving student outcomes in a classroom setting (indirect effects). This is likely because previous studies targeting MBI with teachers have used group-design evaluation methods, which prefer pre–post measurements and ignore the evaluation of behavior change trajectories throughout intervention (Kirk, 2012). Using a single-case design could allow for examining the proximal time related to reduction in teacher stress and improvements in student prosocial behavior. Single-case designs have been used to evaluate MBI with youth (Klingbeil et al., 2017), but not with teachers. Additionally, one

of the major benefits of using a single-case design with teachers is the ability to adjust the intervention method if it turns out unsuccessful (Stapleton & Hawkins, 2015). For example, if the mindfulness technique does not reduce teacher and student stress, researchers can make changes and continue to evaluate the results without waiting until the end of the study. This ability to alter the treatment has the potential to improve teacher and student stress through the optimization of treatment.

Another shortcoming in the literature is evaluation of MBI feasibility and social validity. Intervention feasibility and social validity may be challenging in school settings due to resource constraints and environmental supports such as lack of training and barriers to sustainability (Wilczynski, 2017). To date, there are very few studies investigating the feasibility and social validity of MBI with teachers, which is essential in identifying evidence-based practices and critical components that could be adapted to fit the needs of different service delivery contexts (Sanetti & Kratochwill, 2009). Research suggests that consumers are more likely to adopt an intervention if they perceive it as fair, reasonable, and non-intrusive (Kazdin, 1980). The feasibility and social validity of MBI have been examined in several studies, one with preschool, two with elementary, and one with middle school teachers, with findings suggesting the interventions were feasible, acceptable, and well received (Buchan et al., 2019; Kim et al., 2019; Klatt et al; 2013; Roberts, 2020). However, one study conducted by Ancona and Mendelson (2014) found that there were feasibility challenges with teacher-implemented MBI in urban public schools. These studies helped our understanding of intervention feasibility by having teachers directly rate intervention feasibility and social validity before and after implementation. This is a crucial process in intervention planning because if teachers find

that the intervention is feasible before implementation, but not after the actual intervention, then the intervention is unlikely to be sustained (State et al., 2017). Therefore, it is essential to understand teachers' perception of what is feasible prior to implementation, what the barriers might be prior to implementation after training, and the feasibility after implementation.

Finally, beyond feasibility, the social validity of culturally adapted interventions conducted by teachers can improve student outcomes and intervention fidelity. Cultural adaptations have been shown to be effective and socially valid for Latinx populations and other marginalized groups related to treatment interventions (Bernal et al., 2009). Studies show that cultural adaptations to evidence-based interventions and prevention programs lead to improvements in various student outcomes (e.g., academic, mental health, social skills, drug prevention) by reflecting the teacher's ability to tailor the intervention to their students' needs (Barrera et al., 2017; Durlak & DuPre, 2008). Other research suggests that teachers who made cultural adaptations to drug abuse intervention content had better student outcomes than teachers who delivered the intervention with greater fidelity (Dusenbury et al., 2003). The first known framework for cultural adaptations is the *ecological validity model*, which consists of eight dimensions of interventions (e.g., language, persons, metaphors, content, concepts, goals, methods, and context; Bernal et al., 1995). To date, no studies have looked at the social validity of cultural adaptations related to MBIs with teachers. Particularly in classrooms, this is an important area to explore with MBIs as previous interventions have shown improvements in outcomes when teachers tailored the intervention to their students' needs.

Purpose of the Present Study

Given the importance of reducing teacher stress and increasing students' prosocial behavior, further studies are needed to empirically examine the potential of teacher-implemented MBIs to reduce their teacher stress outcomes and indirectly increase students' prosocial behavior. It is also important to know how to make MBIs feasible for teachers in schools and how to support teachers to implement with fidelity through integrated feedback with potential adaptations throughout the study. This study aimed to address gaps in the literature by training teachers to implement self- and classroom-based MBIs and then evaluating dose-response relationships for both teacher and student outcomes via single-case design methodology. Moving forward, we will refer to the MBI consisting of two parts, the self- and classroom-implementation, as the *treatment package*. Given that feasibility and fidelity are important for long-term sustainability, this study also explored cultural adaptations and the social validity of the treatment package pre- and post-intervention. The following research questions guided the present study:

1. Is there a functional relationship between the treatment package and teacher stress?

2. Is there a functional relationship between the treatment package and student prosocial behavior in the classroom?

3. To what extent is the treatment package socially valid for teachers?

4. To what extent is the treatment package implemented by teachers with fidelity?

Given prior research, we hypothesized that stress would largely decrease for teachers and that we would observe a moderate increase in student prosocial behavior in

the classroom. However, when comparing effect sizes from previous studies, it is important to note that the aforementioned studies looked at group-design effect sizes whereas this study examined single-case design effect sizes. Furthermore, with consistent data indicating that educators struggle to implement most interventions with fidelity (Hagermoser Sanetti et al., 2015; Hagermoser Sanetti & Luh, 2019; Noell et al., 2000), we anticipated that teachers would start with strong implementation fidelity to the treatment package, but that fidelity would decrease over time. In an effort to maintain teachers' fidelity to implementation over time, we provided performance feedback throughout the study.

To address potential implementation barriers, we also measured teachers' perceptions of the social validity of the treatment package prior to implementation to proactively resolve any feasibility concerns. As a result, we hypothesized that teachers participating in our study would also find the treatment package feasible when social validity was measured again post-intervention. Finally, considering there have been no studies examining cultural adaptations related to social validity in MBIs with teachers, we anticipated that intentionally addressing cultural adaptations in the MBI protocol would support strong social validity ratings and high implementation fidelity.

CHAPTER II

METHOD

Research Design

This study used a single-case multiple-baseline design across participants, which has several advantages. Since treatment conditions are staggered across individuals, we were able to observe over time how changes in teacher stress and student prosocial behavior in the classroom may be attributed to the treatment rather than to random chance. Furthermore, by gathering self-report data from teachers and teacher-report data on student prosocial behavior in the classroom, inferences were made about the likeliness that reduction in stress and increase in prosocial behavior may be generalized to the greater population. Finally, our study used a non-concurrent design, where all participants started the study and underwent treatment at different times. This technique allowed for a degree of research flexibility that is especially useful for studying complex social contexts such as educational settings (Harvey et al., 2004). This is advantageous because teachers who initially enroll to participate in the study may start once they are ready and other teachers can be added to the study on a rolling basis. As a result, we were able to retrieve complete data sets within well-defined time constraints, which supported research planning and timely completion of the study. Implementation and follow-up timeframes were extended depending on teacher responsiveness to the treatment package. See Appendix A for an optimal proposed timeline.

The treatment package was provided to four teachers and implemented every school day for 10 days. We initially recruited five teachers, but one teacher dropped from the study after baseline completion due to a family emergency. We chose five teachers as

our criteria based on What Works Clearinghouse criteria for an optimal sample size when using a single-case study design; however, a minimum of three participants is deemed sufficient (Kratochwill et al., 2010). Baseline data was established for teacher and student prosocial classroom behavior for the initial classroom the week prior to the treatment package for five school days. After collecting baseline data for teacher stress and student prosocial behavior for the initial classroom, the treatment package started for this teacher. Data was gathered daily for teacher and student prosocial classroom behavior for two weeks. Each teacher that followed had staggering baseline lengths that differed from the initial teacher's baseline length. Baseline data was collected for the second teacher for 7 school days, the third teacher for 9 days, and the fourth teacher for 11 days. After collecting baseline data for teacher stress and student prosocial classroom behavior, the treatment package started for these teachers and data was collected daily for teacher stress and student prosocial classroom behavior. The treatment package was complete for the teachers after two weeks (or 10 school days) from the start of MBI implementation. After completing the intervention, two-week and one-month follow-up questionnaires were conducted to ask teachers if they were still using the treatment package, how often they were using it, and if any modifications were made.

Participants

Participant Recruitment

Participants were four elementary teachers from two schools, who had classrooms with approximately 23 students per class (grades 1–5; ages 6–10 years). District-level research approval was obtained prior to reaching out to the principal at the school sites. The principal at the school site received an email with an introduction to the study asking

if they were interested in having this study conducted at their school. Principals had three days to respond before the research team reached out to the next school of interest. Following, the research team connected with the principal based on communication preference to go over study details. The research team had the principals send out the recruitment emails to teachers who were eligible and/or refer teachers to the researcher to reach out separately (see Appendix B for teacher recruitment flyer). A total of five elementary schools were contacted and only two principals from the schools responded. Our rationale for choosing elementary teachers is because lower-grade teachers are reported to experience higher workplace stress than upper-grade teachers (Agai-Demjada et al., 2015).

Interested teachers were provided with a Qualtrics survey to screen teachers based on current levels of stress and student prosocial behavior. Teacher stress was screened using the Perceived Stress Scale (PSS), where scores between 14–40 met eligibility, given this range indicated teacher participants were experiencing elevated levels of stress pre-treatment, preventing possible floor effects. Student prosocial classroom behavior was screened with teacher-report using the Direct Behavior Rating (DBR) scale, where academic engagement and respectfulness scores must be less than 80% and disruptive behavior at least 20% to be eligible to participate. Two teachers who were interested in the study did not meet the eligibility criteria on the screeners, so they were informed of their non-eligibility and thanked for their time. Recruitment ended once five teachers were recruited. Data for the four teachers who fully participated in the study are presented in the Results section.

Participant Demographics

Demographic information on participating teachers were collected prior to collecting baseline data. Demographic information for teachers included questions on age, gender identity, racial/ethnic background, years of experience, grade level they are teaching, and whether their classroom had prior mindfulness exposure. Teachers' names were changed to pseudonyms to protect their confidentiality. Teacher 1, Jessie, identified as a 29-year-old White woman with five years of experience teaching third grade. Jessie reported that her classroom had prior mindfulness exposure. Teacher 2, Aerith, identified as a 36-year-old White woman with 12 years of experience teaching second grade. Aerith stated that her classroom did not have prior mindfulness exposure. Teacher 3, Cloud, identified as a 30-year-old White man with three years of experience teaching fifth grade. Cloud mentioned that his classroom had prior mindfulness exposure. Teacher 4, Tifa, identified as a 30-year-old White woman with seven years of experience teaching fifth grade. Tifa reported that her classroom had prior mindfulness exposure. Jessie and Aerith were from the same school while Cloud and Tifa were in the same school. All teachers presented with elevated levels of stress according to the eligibility screeners. Likewise, their classrooms met eligibility for lower academic engagement and respectful behavior and higher levels of disruptive behavior according to the screeners. After study completion, student demographic data were collected. A data custodian at each school reported on the aggregated classroom demographics including sex, racial/ethnic background, and whether the students have free or reduced lunch (see Table 1 for classroom demographics).

Procedure

Compensation

Teachers were compensated throughout the study based on benchmark completion for a total of $300 in cash. Specifically, teachers received $75 for the virtual 1 h training they received at the onset of the treatment package. For each week that teachers completed the treatment package and filled out the required measures, they received another $50 (for a total of $100). Upon study completion, teachers received an additional $25 for each measure they completed post-intervention (i.e., feasibility questionnaire, two-week and one-month follow-up questionnaire) for a total of $75. Teachers were also compensated with a bonus payment of $50 if they completed all measures involved in the study. The total amount of compensation each teacher received upon study completion was $300.

Teacher Training

At the onset of the treatment package, participating teachers completed a 1 h, one-on-one virtual training session with the researcher. The core components of this training were to (a) give teachers an opportunity to reflect on personal and wider implications through personal mindfulness practice, (b) develop an understanding of the use and impact of mindfulness for improving teachers' stress and student prosocial behavior, (c) understand the aim and importance of the project, and (d) provide an opportunity for teachers to practice implementing the treatment package. During this training, teachers learned about mindfulness, the benefits of mindfulness on reducing stress for teachers and students, as well as how to conduct the treatment package in the classroom. Learning about mindfulness from a personal perspective enabled teachers to explore what it means to systematically approach the experience through non-judgmental attention and to discover some of the challenges and benefits of this process. Teachers also learned about

the treatment package and related implementation steps, including the mindful body scan that was implemented for the classroom intervention (see Appendix C). There were opportunities for teachers to engage in mindfulness practice, review the knowledge and skills learned, and ask questions. Any materials needed for implementation of the treatment package were emailed to teachers immediately after the training (see Appendix D for complete procedure).

Social Validity Evaluation and Cultural Adaptation

At the end of the training, teachers had the chance to discuss the perceived barriers of the treatment package with the purpose of collaboratively resolving and problem-solving presenting concerns. To facilitate cultural adaptations, Bernal et al.'s (1995) ecological validity model was modified to a series of questions presented to teachers for the purposes of evaluating the goodness-of-fit of the treatment package within the teacher's classroom culture (see Appendix E). The eight dimensions in the ecological validity model include language, persons, metaphors, content, concepts, goals, methods and context. The eight dimensions in the ecological validity model allowed the researcher to adhere to the two basic recommendations: (a) to get to know the target population and (b) to adapt delivery methods to best reach the target population (Bernal & Sáez-Santiago, 2006; Bernal et al., 1995; Castro et al., 2004; Domenech-Rodriguez & Wieling, 2005; Lau, 2006; Lopez et al., 2002). This framework was adapted as a social validity guide for teachers to adapt mindfulness-based interventions at a more personal level to their students in the classroom rather than to change the existing structure of MBIs. Teachers were asked to complete this cultural adaptation questionnaire during the training session (prior to the social validity questionnaire) to make necessary

modifications prior to the start of the treatment package. Teachers then completed a

social validity questionnaire to measure teachers' acceptability of the treatment package

pre-treatment (see Appendix I). Any feasibility concerns or cultural adaptations were

modified in real-time and changed prior to teachers receiving the final script for the

treatment package.

MBI Treatment Package

The MBI conducted by teachers consisted of implementing the treatment package

(self- and classroom-based components) for two weeks. Prior to starting class each day,

teachers were asked to listen to a 5 min audio-recording (in another person's voice) of a

mindful breathing exercise for the self-implementation component (see Appendix F for

the transcript). For the classroom-based implementation components, teachers were given

a mindful body scan script to read to the students near the start of class for 5 min and

again after lunch for 5 min (see Appendix C for script) during each school day. Teachers

implemented the treatment package for a total of 10 school days.

Implementation Fidelity Checks

A research assistant was paid $20 per hour to conduct weekly implementation

fidelity checks for the classroom-based component of the treatment package for all

participating teachers. The research assistant was trained on the fidelity protocol prior to

collecting data in the schools using Sanetti and Collier-Meek's (2019) protocol on

intervention fidelity data collection. First, the research assistant learned about the

assessment method and how to use the intervention fidelity data collection form. The

research assistant was also provided with background information on intervention fidelity

and the intervention itself. Next, the research assistant had direct training on how to

administer the fidelity checks and received a written guide to data collection. Intervention fidelity data was reviewed daily by the principal researcher to ensure the use of data-based decision-making. During the fidelity checks, the research assistant went into the classroom to observe the teacher-implemented MBI. A fidelity checklist was used by the research assistant to mark off teacher administration in real time (See Appendix G). Teachers were provided with performance feedback from the principal researcher based on the research assistant's fidelity checks three times per week. Overall, the research assistant conducted 22 fidelity checks across four teachers. In sum, the research assistant worked for 30.3 hours and was compensated a total of $606.

Data Collection

At the end of the school day during baseline and intervention phases, teachers completed a brief electronic survey including the Direct Behavior Rating (DBR) Scale and the single-item Teacher Stress and Coping Measure (see Appendix H). In addition, teachers were able to list any questions, feedback, barriers, or modifications that occurred to the treatment package that day. This allowed the principal researcher to collaboratively modify the intervention as needed. During the intervention phase, these daily questionnaires also included, at the end, self-reported fidelity of the self-implemented mindfulness exercise as well as self-reported fidelity of the classroom implementation. Our rationale for listing the outcome questions first was to prevent a halo effect from responding to the fidelity questions. Teachers answered the questionnaires using a Qualtrics survey each day (see Appendix H for End of Day Questionnaire). An email reminder was sent each day after school by the researcher to remind teachers to fill out the questionnaires. Beyond the daily measures, teachers filled out the social validity

questionnaire upon study completion (see Appendix I). Both two-week and one-month follow-ups were conducted to ask teachers if they were still using the treatment package, how often they were using it, and if any modifications were made.

Measures

Perceived Stress Scale (PSS)

The PSS is a 10-item self-report questionnaire developed for measuring the perception of stress (Cohen et al., 1983). Participants respond on a 5-point scale that ranges from 0 (*never*) to 4 (*very often*). Responses on four out of 10 questions are reverse scored and then summed to create a scale score. Higher scores indicate greater levels of perceived stress. Items were created to examine how unpredictable, uncontrollable, and overloaded participants find their lives (Cohen et al., 1983). The scale includes questions about the current levels of experienced stress. The items are easy to comprehend and quick to administer. Internal consistency reliability, factorial validity, and hypothesis validity (e.g., research reflecting the predictions about the relations between constructs) of the PSS are well reported (Lee, 2012). Furthermore, findings from a study using a sample of early childhood teacher candidates found this scale to be a reliable and valid measure to assess perceived stress (Lee & Jeong, 2019). The PSS was used as an eligibility screener in the present study to ensure teacher participants were experiencing elevated levels of stress pre-treatment package and to prevent possible floor effects.

Single-item Teacher Stress and Coping Measure

The brief teacher stress and coping measure consist of two single-item scales asking about overall perceptions of teacher stress and coping. The stress item asks, "How stressful is your job?" with an 11-point rating scale ranging from 0 (*not stressful*) to 10

(*very stressful*). The coping item asks, "How well are you coping with the stress of your job right now?" with an 11-point rating scale ranging from 0 (*not well*) to 10 (*very well*). Findings from a study found this measure to have concurrent and predictive validity for monitoring teacher functioning (Eddy et al., 2019). This brief self-report was used as the primary outcome measure for teacher stress and coping.

Direct Behavior Rating (DBR)

The DBR is an evidence-based teacher-report measure used to assess key domains of student prosocial behavior in the classroom (i.e., academically engaged, respectful, and disruptive domains). This assessment tool has three items and is rated on an 11-point scale ranging from 0 (0%; *never*) to 10 (100%, *always*). Teachers observed and estimated the percentage of time the class exhibited prosocial behavior throughout the school day. This easy-to-use assessment was used as the eligibility screener, during the treatment package, and post-intervention (after 1 month of administering the treatment package) to measure the relative proportion of prosocial classroom behavior exhibited across academically engaged, respectful, and disruptive domains.

Social Validity

The Usage Rating Profile-Intervention Revised (URP-IR) is a 29-item self-report scale, which was used to measure the social validity of implementing the treatment package in a school setting pre-treatment and post-treatment (see Appendix I; Briesch et al., 2013). Items are rated on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Scoring is categorized into subscales by *acceptability*, *understanding* of the intervention, *home-school collaboration*, *feasibility*, *system climate*, and *system support*. Some items are reverse coded, so it is important to interpret the subscales

separately. For example, a low score for system support reflects a greater ability to independently implement the intervention. Therefore, if aggregating across all categories to find an overall mean indicative of more favorable responses, reverse coding all items in that category should be considered. The questions in this scale were slightly modified to fit teacher implementation in classroom settings. For example, some questions related to home-school collaboration (items 5, 15, and 28) were omitted because they were not applicable for this intervention. Results from a study found supporting evidence of the URP-IR to capture factors that influence intervention use and performance in multi-tiered settings (Neugebauer et al., 2016).

To examine sustainability of the intervention post-treatment, the researcher checked in with the teachers after two weeks and again after one month to see if they were still implementing the treatment package, for which reasons, and to what extent. The questions asked included, "Are you still using the treatment package? Why or why not?", "How often are you using the treatment package?", and "What modifications did you make to the treatment package, if any?"

Self-Report Implementation Fidelity

After the onset of the treatment package, teachers were asked to self-monitor their MBI implementation (both self- and classroom-based components) as one form of measuring fidelity. A checklist evaluating the core components of the treatment package was included in the brief electronic survey mentioned earlier, in which teachers checked off which components of the treatment package were completed daily. The fidelity questions included, "Did you listen to the 5-minute meditation exercise prior to starting class today?", "Did you tell your classroom about mindfulness and the benefits of

practicing?", "Did you read the entire mindfulness exercise for your classroom today word for word?", and "Did you ask your students how they felt after the mindful exercise?" Teachers were given an option to mark "yes" or "no" for each of these questions.

Three times a week, the research assistant attended an MBI session in person for each teacher to observe classroom implementation fidelity, using similar checklist items mentioned above but with different response options. The research assistant had the option of checking *not at all*, *somewhat* (with an open text box for further elaboration), and *totally*. The first question asked, "To what extent did the teacher talk about mindfulness and its benefits before starting the intervention? If *somewhat* explain why." An example was provided for "somewhat", such as "Teacher says they are about to start the intervention but doesn't explain what it is or mention the benefits; mentions some benefits but not all; omits 1–2 sentences from this section." The second question asked, "To what extent did the teacher read the script close to/exactly like the script with appropriate pauses? If *somewhat*, explain why." An example for "somewhat" included, "Teacher skips the "ZIP" motion; pauses sometimes, but not all the time; rushes through the intervention; omits 1–2 sentences from this section." The last question in the fidelity checks asked, "To what extent did the teacher ask the students how they felt after the mindfulness exercise? If *somewhat*, explain why." An example provided for "somewhat" included, "If the teacher rushes through, doesn't respond to students, etc." The research assistant provided fidelity check results to the principal researcher at the end of each observation, and the principal researcher emailed the teacher immediately after reviewing fidelity results with direct feedback on their performance. Teachers received feedback

after every fidelity observation (e.g., for both good and subpar implementation; see Appendix J for performance feedback email script).

Data Analysis

For Research Question 1 and 2, results were analyzed using visual inspection where a conclusion was reached about the reliability and consistency of treatment package effects within and across participants by visually examining the graphed data. The first characteristic used in the visual analysis was to examine change in trends across phases. Consistent changes in trend across phases can serve as a basis for determining whether the data pattern meets the expectations of the treatment package (i.e., dependent variables increasing or decreasing in theoretically consistent directions). The second characteristic used in this visual analysis was the shift in level, which refers to a break in the graphical display of the data or discontinuity of performance from the end of one phase to the beginning of the next phase.

In addition to visual analysis, descriptive statistics were used to measure the mean and range of dependent variables for both baseline and treatment phases. Furthermore, effect sizes gauging the difference between baseline and treatment phases for each participant were examined using the Non-overlap of All Pairs (NAP) and Robust Improvement Rate Difference (IRD) indices. The NAP is an estimate of the probability that a randomly selected observation from the intervention phase improves from a randomly selected observation from the baseline phase (Parker & Vannest, 2009). The IRD is defined as the degree of overlap between the observations of each phase (Parker et al., 2011). The effect size of the NAP and IRD were analyzed by using the online single-

case effect size calculator at https://jepusto.shinyapps.io/SCD-effect-sizes (Pustejovsky et al., 2021).

For Research Question 3, the average-item response of each teacher's responses were calculated to the social validity rating measure subscales and interpreted these according to the qualitative response anchors to describe their perceptions of social validity across domains. Finally, for Research Question 4, implementation fidelity ratios were calculated for each teacher by dividing the number of total components implemented (according to self-report) by the number of total possible treatment package components (according to the checklist) and interpret the resulting level of fidelity according to > 80% criteria, which is commonly used in school-based interventions. The research assistant's implementation fidelity ratios were also calculated using the same method.

CHAPTER III

RESULTS

Table 1 presents classroom demographic data. Table 2 presents intervention effect sizes for each dependent variable across teachers. Table 3 presents means of dependent variables across participants and phases. Table 4 presents pre- and post-treatment social validity rating across participants. Figures 1–2 present visual displays of teachers' self-reported stress and coping, respectively. Figures 3–5 present visual displays of teachers' daily ratings of their students' classroom prosocial behavior across academic engagement, respectful behavior, and disruptive behavior domains, respectively. Results for each participant are described below.

Jessie

Cultural Adaptations

Regarding ecological validity considerations, Jessie found the wording in the intervention acceptable (*language*). She mentioned that potentially having another adult's voice for the MBI could be helpful since her voice might not be as relaxing to students given her role as their teacher telling them what to do (*persons*). After following up, she said that her voice would be fine for now and she would let the researcher know if anything changed. The metaphors used in the MBI reflected the folktales and symbols of her classroom (*metaphors*). Jessie mentioned that if the intervention did not fit her classroom culture, she would have added new content that reflected knowledge of or sensitivity to the values, customs, traditions, and typical experiences of her classroom (*content*). She found that the content of the intervention was relevant for her students' cultures of origin (*content*). Further, she stated that there were no changes to the wording

of the script that would have made the MBI more relevant to her classroom (*concepts*).

Jessie also endorsed that the goal of the intervention was a value to her classroom (*goals*).

In terms of what she is hoping to get out of study participation, she wanted to make

mindfulness a consistent part of her life and that incorporating mindfulness for her

students could help with their behavior issues (*goals*). She found that reading the script of

the mindfulness intervention was the most effective way to practice mindfulness in her

classroom (*methods*). Finally, Jessie stated that the effects of the MBI could be helpful

with her students' life circumstances (*context*). Related to questions, feedback, barriers,

or modifications that occurred during the treatment package, Jessie noticed that some

students seemed bothered about using the same script each time. The principal researcher

asked if she would like to make adjustments to the intervention, but Jessie declined.

Teacher Stress and Coping Outcomes

Jessie's mean rate of stress was 8 (range = 6–10) during baseline. During the

treatment package, stress decreased to a mean of 7.3 (range = 5–10). NAP indicated a

negligible effect whereas IRD for teacher stress indicated small effect sizes in the desired

direction (see Table 2). The mean rate of coping was 4.8 (range = 3–6). During the

treatment package, coping decreased slightly to a mean of 4.4 (range = 2–7). NAP

indicated a negligible effect whereas IRD for teacher coping indicated small effects in the

desired direction (see Table 2). A post-hoc analysis of effect size in the undesired

direction indicated mixed results, with IRD indicating a small effect and NAP indicating

a negligible effect (see Table 2).

Classroom Prosocial Behavior Outcomes

The mean rate of academic engagement was 5.2 (range = 4–6) during baseline. During the treatment package, academic engagement increased to a mean of 6.1 (range = 5–7). NAP and IRD for academic engagement indicated medium effect sizes in the desired direction (see Table 2). The mean rate of respectful behavior was 6.8 (range = 6–8) during baseline. During the treatment package, respectful behavior decreased to a mean of 6.5 (range = 4–8). NAP indicated a negligible effect whereas IRD indicated a small effect (see Table 2) for respectful behavior. A post-hoc analysis of effect size in the undesired direction indicated mixed results, with IRD indicating a small effect (IRD = 0.25) and NAP indicating a negligible effect (NAP = 0.56). The mean rate of disruptive behavior was 5.8 (range = 5–7) during baseline. During the treatment package, disruptive behavior decreased to a mean of 4.7 (range = 2–7). NAP indicated a negligible effect whereas IRD for disruptive behavior indicated a small effect size in the desired direction (see Table 2).

Social Validity

Regarding URP-IR results prior to intervention implementation, Jessie's average item responses indicated she *strongly agreed* to Acceptability (*M* = 5.8), Understanding (*M* = 6), Feasibility (*M* = 6), and System Climate (*M* = 6), suggesting very favorable initial impressions of the treatment package. Moreover, Jessie's average item responses indicated she *disagreed* (*M* = 1.5) to System Support pre-intervention, meaning that she did not think she would need external support to use the treatment package. After intervention implementation, URP-IR results indicated that Jessie *agreed* to Acceptability (*M* = 5.2) and Feasibility (*M* = 5), and *strongly agreed* to Understanding (*M* = 5.6) and

Systems Climate (*M* = 5.8), indicating still favorable, yet slightly attenuated, perceptions of social validity post-intervention. Furthermore, Jessie *disagreed* (*M* = 1.5) to System Support post-intervention, meaning that her perceived need for external support did not change after implementation of the treatment package. See Table 4 for more details.

Implementation Fidelity

Self-reported fidelity observations by Jessie indicated that she listened to the 5 min meditation exercise prior to starting class 10/10 times (100%), talked about mindfulness and its benefits before starting the intervention 10/10 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 10/10 times (100%), and asked the students how they felt after the mindfulness exercise 10/10 times (100%). The research assistant completed six fidelity checks for Jessie's classroom-based implementation component. Fidelity observations of core intervention components indicated Jessie talked about mindfulness and its benefits before starting the intervention 5/6 times (83%), read the script close to/exactly like the standardized script with appropriate pauses 6/6 times (100%), and asked the students how they felt after the mindfulness exercise 6/6 times (100%). Overall, across observations, Jessie implemented 17/18 (94%) key components with fidelity, suggesting a very high level of integrity to the intervention plan.

Post-Intervention Follow-up

After two weeks post-MBI completion, Jessie reported that she had not been using the treatment package consistently due to busyness. As a result, how often the treatment package was being used after intervention was not reported. However, whenever Jessie was able to use the intervention, modifications were made to the

intervention by using different breathing exercises and meditations after lunch. One month after treatment package completion, Jessie stated that she no longer used the treatment package because she got out of the habit. Yet, she has been doing a form of breathing exercise every day after lunch, rather than in the mornings. At one month post intervention, the DBR was used to gauge classroom sustainability outcomes. Her classroom was reported to be academically engaged 70% of the time, respectful 60% of the time, and disruptive 40% of the time (see Figures 3–5).

Aerith

Cultural Adaptations

After introducing the intervention during training, Aerith was asked about cultural adaptations that may be applicable to her classroom. Regarding ecological validity considerations, Aerith found the wording in the intervention acceptable (*language*). She endorsed that her students would enjoy listening to her voice for the intervention as opposed to another adult's voice or student's voice (*persons*). The metaphors used in the MBI reflected the folktales and symbols of her classroom (*metaphors*). Aerith stated that if the intervention did not fit her classroom culture, she would have added new content that reflects knowledge of or sensitivity to the values, customs, traditions, and typical experiences of her classroom (*content*). She also found that the content of the intervention was relevant for her students' cultures of origin (*content*). Further, she stated that there were no changes to the wording of the script that would have made the MBI more relevant to her classroom (*concepts*). Aerith also endorsed that the goal of the intervention was a value to her classroom (*goals*). In terms of what she was hoping to get out of study participation, she wanted to give students a tool to use while they were 7 or 8

years old, since mindfulness is a lifelong tool for them to use (*goals*). She found that

reading the script of the mindfulness intervention is the most effective way to practice

mindfulness in her classroom (*methods*). Finally, Aerith stated that the effects of the MBI

could be helpful with her students' life circumstances (*context*). Related to questions,

feedback, barriers, or modifications that occurred during the treatment package, Aerith

did not report any.

Teacher Stress and Coping Outcomes

The mean rate of stress was 5.6 (range = 4–6) during baseline. During the

treatment package, stress decreased to a mean of 4.3 (range = 3–6). NAP and IRD for

teacher stress indicated medium effect sizes in the desired direction (see Table 2). The

mean rate of coping was 5.7 (range = 4–7). During the treatment package, coping

increased to a mean of 6 (range = 5–7). NAP and IRD for teacher coping indicated small

effects in the desired direction (see Table 2).

Classroom Prosocial Behavior Outcomes

The mean rate of academic engagement was 6.9 (range = 6–8) during baseline.

During the treatment package, academic engagement increased to a mean of 7.1 (range =

6–8). NAP and IRD for academic engagement indicated small effect sizes in the desired

direction (see Table 2). The mean rate of respectful behavior was 7.4 (range = 7–8)

during baseline. During the treatment package, respectful behavior increased to a mean of

7.9 (range = 7–9). NAP indicated a medium effect whereas IRD indicated a small effect

(see Table 2) for respectful behavior. The mean rate of disruptive behavior was 5.4 (range

= 5–6) during baseline. During the treatment package, disruptive behavior decreased to a

mean of 4.2 (range = 3–6). NAP and IRD indicated medium effect sizes in the desired direction (see Table 2).

Social Validity

Regarding URP-IR results prior to intervention implementation, Aerith's average item responses indicated she *agreed* to Acceptability (M = 4.8), Understanding (M = 5), Feasibility (M = 5), and System Climate (M = 4.8), suggesting favorable initial impressions of the treatment package. Moreover, Aerith's average item responses indicated she *slightly agreed* (M = 3.5) to System Support pre-intervention, meaning that she somewhat thought that she would need external support to use the treatment package. After intervention implementation, URP-IR results indicated that Aerith *agreed* to Acceptability (M = 5), Understanding (M = 5), Feasibility (M = 5), and System Climate (M = 5), indicating more favorable perceptions of social validity post-intervention. Furthermore, Aerith *slightly disagreed* (M = 3) to System Support post-intervention, meaning that her perceived need for external support changed after treatment package implementation. See Table 4 for more details.

Implementation Fidelity

Self-reported fidelity observations by Aerith indicated that she listened to the 5 min meditation exercise prior to starting class 10/10 (100%), talked about mindfulness and its benefits before starting the intervention 10/10 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 10/10 times (100%), and asked the students how they felt after the mindfulness exercise 10/10 times (100%). The research assistant completed four fidelity checks for Aerith's classroom-based implementation component. Fidelity observations of core intervention components

indicated Aerith talked about mindfulness and its benefits before starting the intervention 4/4 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 4/4 times (100%), and asked the students how they felt after the mindfulness exercise 4/4 times (100%). Overall, across observations, Aerith implemented 12/12 (100%) key components with fidelity, suggesting a very high level of integrity to the intervention plan.

Post-Intervention Follow-up

Two weeks after treatment package completion, Aerith reported that she uses it sometimes in the morning, but not very consistently in the afternoon. She reported using the treatment package once a day or once every two days. Whenever Aerith was able to use the intervention, modifications were made to the intervention by changing the script. One month after treatment package completion, Aerith stated that she is not using the treatment package consistently. However, she mentioned using another mindfulness breathing exercise in her class more consistently. Yet, whenever she uses the treatment package, she uses the script 1-2 times per week rather than using it twice per day. At one month post intervention, the DBR was used to gauge classroom sustainability outcomes. Her classroom was reported to be academically engaged 60% of the time, respectful 80% of the time, and disruptive 60% of the time (see Figures 3-5).

Cloud

Cultural Adaptations

After introducing the intervention during training, Cloud was asked about cultural adaptations that may be applicable to his classroom. Regarding ecological validity considerations, Cloud found the wording in the intervention acceptable (*language*). He

endorsed that his students would enjoy listening to his voice for the intervention as opposed to another adult's voice or student's voice (*persons*). The metaphors used in the MBI reflected the folktales and symbols of his classroom (*metaphors*). Cloud mentioned that if the intervention did not fit his classroom culture, he would have added new content that reflects knowledge of or sensitivity to the values, customs, traditions, and typical experiencees of his classroom (*content*). He also found that the content of the intervention was relevant for his students' cultures of origin (*content*). Further, he stated that the wording of the script didn't feel natural so the language was adjusted to take out "good morning" and "good afternoon" (*concepts*). Cloud also endorsed that the goal of the intervention was a value to his classroom (*goals*). In terms of what he is personally hoping to get out of study participation, he wanted to better handle stress when he is having a stressful day and he also wanted to help students with their stress (*goals*). He found that reading the script of the mindfulness intervention was the most effective way to practice mindfulness in his classroom (*methods*). Finally, Cloud stated that the effects of the MBI could be helpful with his students' life circumstances (*context*). Related to questions, feedback, barriers, or modifications that occurred during the treatment package, Cloud mentioned that he encouraged his students ahead of time to keep their eyes closed during the exercise since the students who kept their eyes open participated much less and would distract their peers.

Teacher Stress and Coping Outcomes

The mean rate of stress was 6 (range = 4–7) during baseline. During the treatment package, stress remained the same mean of 6 (range = 4–7). NAP and IRD for teacher stress indicated a negligible effect in the desired direction (see Table 2). The mean rate of

coping was 5.8 (range = 3–8). During the treatment package, coping decreased to a mean

of 4.7 (range = 3–7). NAP indicated a negligible effect whereas IRD for teacher coping

indicated small effects in the desired direction (see Table 2). A post-hoc analysis of effect

size in the undesired direction indicated mixed results, with IRD indicating a small effect

(IRD = 0.37) and NAP indicating a negligible effect (NAP = 0.68).

Classroom Prosocial Behavior Outcomes

The mean rate of academic engagement was 4.4 (range = 2–6) during baseline.

During the treatment package, academic engagement increased to a mean of 5 (range =

3–7). NAP and IRD for academic engagement indicated small effect sizes in the desired

direction (see Table 2). The mean rate of respectful behavior was 4.6 (range = 2–7)

during baseline. During the treatment package, respectful behavior increased to a mean of

4.8 (range = 3–7). NAP and IRD for respectful behavior indicated small effect sizes in

the desired direction (see Table 2). The mean rate of disruptive behavior was 5.9 (range =

3–8) during baseline. During the treatment package, disruptive behavior decreased to a

mean of 5.6 (range = 3–8). NAP and IRD for disruptive behavior indicated small effect

sizes in the desired direction (see Table 2). Of note, we removed two data points for

Cloud due to school delays, which didn't seem to accurately reflect the usual day-to-day

data due to heightened stress with teacher and increase in students' disruptive behavior.

We balanced this out by including two additional intervention days, which still totaled to

14 intervention days.

Social Validity

Regarding URP-IR results prior to intervention implementation, Cloud's average

item responses indicated he *agreed* to Acceptability (*M* = 5.4) and Understanding (*M* = 5)

and *strongly agreed* to Feasibility ($M = 6$), and System Climate ($M = 5.8$), suggesting very favorable initial impressions of the treatment package. Moreover, Cloud's average item responses indicated he *strongly disagreed* ($M = 1.5$) to System Support pre-intervention, meaning that he did not think he would need external support to use the treatment package. After intervention implementation, URP-IR results indicated that Cloud *agreed* to Acceptability ($M = 5$) and *strongly agreed* to Understanding ($M = 6$), Feasibility ($M = 5.5$), and Systems Climate ($M = 5.8$), indicating very favorable, yet slightly attenuated, perceptions of social validity post-intervention. Furthermore, Cloud *slightly agreed* ($M = 3.5$) to System Support post-intervention, meaning that he perceived a slight need for external support, which changed after implementation of the treatment package. See Table 4 for more details.

Implementation Fidelity

Self-reported fidelity observations by Cloud indicated that he listened to the 5 min meditation exercise prior to starting class 9/10 times (90%), talked about mindfulness and its benefits before starting the intervention 10/10 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 10/10 times (100%), and asked the students how they felt after the mindfulness exercise 10/10 times (100%). The research assistant completed six fidelity checks for Cloud's classroom-based implementation component. Fidelity observations of core intervention components indicated Cloud talked about mindfulness and its benefits before starting the intervention 6/6 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 6/6 times (100%), and asked the students how they felt after the mindfulness exercise 6/6 times (100%). Overall, across observations, Jessie implemented

18/18 (100%) key components with fidelity, suggesting a very high level of integrity to the intervention plan.

Post-Intervention Follow-up

After two weeks after treatment package completion, Cloud reported that he had not been using the treatment package due to the students' frustration using the same script as well as the limited amount of time he has to implement it. As a result, how often the treatment package was being used after intervention and modifications made was not reported. One month after treatment package completion, Cloud stated that he no longer used the treatment package because he got out of the habit. At one month post intervention, the DBR was used to gauge classroom sustainability outcomes. His classroom was reported to be academically engaged 40% of the time, respectful 40% of the time, and disruptive 80% of the time (see Figures 3-5).

Tifa

Cultural Adaptations

After introducing the intervention during training, Tifa was asked about cultural adaptations that may be applicable to her classroom. Regarding ecological validity considerations, Tifa found the wording in the intervention acceptable (*language*). She endorsed that her students would enjoy listening to her voice for the intervention as opposed to another adult's voice or student's voice (*persons*). The metaphors used in the MBI reflected the folktales and symbols of her classroom (*metaphors*). Tifa mentioned that if the intervention did not fit her classroom culture, she would have added new content that reflects knowledge of or sensitivity to the values, customs, tradItions, and typical experiences of her classroom (*content*). She also found that the content of the

intervention was relevant for her students' cultures of origin (*content*). Further, changes were made to the wording of the script by removing the "special star" since her 5th graders might find it silly (*concepts*). Tifa also endorsed that the goal of the intervention was a value to her classroom (*goals*). In terms of what she was hoping to get out of study participation, she wanted to help her students and saw the benefit for teachers (*goals*). She found that reading the script of the mindfulness intervention was the most effective way to practice mindfulness in her classroom (*methods*). Finally, Tifa stated that the effects of the MBI could be helpful with her students' life circumstances (*context*). Related to questions, feedback, barriers, or modifications that occurred during the treatment package, Tifa did not report any.

Teacher Stress and Coping Outcomes

The mean rate of stress was 7.1 (range = 5–10) during baseline. During the treatment package, stress slightly increased to a mean of 7.2 (range = 5–10). NAP indicated a negligible effect whereas IRD for teacher stress indicated a small effect size in the desired direction (see Table 2). A post-hoc analysis of effect size in the undesired direction indicated mixed results, with IRD indicating a small effect (IRD = 0.05) and NAP indicating a negligible effect (NAP = 0.51). The mean rate of coping was 6.5 (range = 3–8). During the treatment package, coping increased to a mean of 7.3 (range = 4–8). NAP indicated a medium effect whereas IRD for teacher stress indicated a small effect size in the desired direction (see Table 2).

Classroom Prosocial Behavior Outcomes

The mean rate of academic engagement was 7.2 (range = 5–9) during baseline. During the treatment package, academic engagement increased to a mean of 7.9 (range =

7–10). NAP and IRD for academic engagement indicated small effect sizes in the desired direction (see Table 2). The mean rate of respectful behavior was 7.6 (range = 4–10) during baseline. During the treatment package, respectful behavior increased to a mean of 7.9 (range = 6–10). NAP and IRD for respectful behavior indicated small effect sizes in the desired direction (see Table 2). The mean rate of disruptive behavior was 4.5 (range = 1–9) during baseline. During the treatment package, disruptive behavior decreased to a mean of 3.2 (range = 2–5). NAP indicated a medium effect whereas IRD for disruptive behavior indicated a small effect size in the desired direction (see Table 4).

Social Validity

Regarding URP-IR results prior to intervention implementation, Tifa's average item responses indicated she *agreed* to Acceptability ($M = 5.2$), Understanding ($M = 5$), Feasibility ($M = 5.3$), and *strongly agreed* to System Climate ($M = 5.6$), suggesting very favorable initial impressions of the treatment package. Moreover, Jessie's average item responses indicated she *slightly agreed* ($M = 3.5$) to System Support pre-intervention, meaning that she somewhat thought she would need external support to use the treatment package. After intervention implementation, URP-IR results indicated that Tifa *strongly agreed* to Acceptability ($M = 6$), Understanding ($M = 6$), Feasibility ($M = 6$), and Systems Climate ($M = 6$), indicating highly favorable perceptions of social validity post-intervention. Furthermore, Jessie *strongly disagreed* ($M = 1$) to System Support post-intervention, meaning that her perceived need for external support changed after implementation of the treatment package. See Table 4 for more details.

Implementation Fidelity

Self-reported fidelity observations by Tifa indicated that she listened to the 5-minute meditation exercise prior to starting class 10/10 times (100%), talked about mindfulness and its benefits before starting the intervention 10/10 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 10/10 times (100%), and asked the students how they felt after the mindfulness exercise 10/10 times (100%). The research assistant completed six fidelity checks for Tifa's classroom-based implementation component. Fidelity observations of core intervention components indicated Tifa talked about mindfulness and its benefits before starting the intervention 6/6 times (100%), read the script close to/exactly like the standardized script with appropriate pauses 5/6 times (83%), and asked the students how they felt after the mindfulness exercise 6/6 times (100%). Overall, across observations, Tifa implemented 17/18 (94%) key components with fidelity, suggesting a very high level of integrity to the intervention plan.

Post-Intervention Follow-up

Two weeks after treatment package completion, Tifa reported that she had been using the treatment package because she found it very helpful in reducing problem behaviors and helping her students refocus. She also stated that it was extremely useful to implement before a test. Tifa uses the treatment package once a day most of the time, but once every other day if she couldn't do it every day. When Tifa used the intervention, she sometimes made modifications by omitting the mindfulness benefits section. One month after treatment package completion, Tifa stated that she still used the intervention because it helped her students calm down and re-engage with classroom activities. She

also continued to find it very helpful in getting her students to take a test. She used the treatment package every other day on average, and no further modifications were made other than spreading out the time it was used. At one month post intervention, the DBR was used to gauge classroom sustainability outcomes. Her classroom was reported to be academically engaged 80% of the time, respectful 80% of the time, and disruptive 20% of the time (see Figures 3-5).

CHAPTER IV

DISCUSSION

Teacher stress has a negative impact on teacher performance, maintenance, and student outcomes (Agai-Demjaha et al., 2015; Greenberg et al., 2016; Yoon, 2002. As such, teaching has been ranked as one of the highest professions in stress-related outcomes (Johnson et al., 2005; Carver-Thomas & Darling-Hammond, 2019). This negatively influences teacher and student well-being (Geving, 2007). Mindfulness has been gaining popularity as a potential solution to improve teacher wellbeing. To date, there are few studies focused on indirect MBIs with teachers and no studies that examine fidelity to teacher-implemented MBIs in a classroom setting. It is also crucial to examine the dose-response relationship for MBIs with teachers for reducing teacher stress and improving student outcomes in a classroom setting as there is no known research related to this. Further, there are very few studies investigating the feasibility of MBIs for teachers and no studies looking at the social validity of cultural adaptations related to MBIs with teachers.

The purpose of this study was to examine the effects of a teacher-implemented MBI on their stress and coping as well as on teachers' perceptions of students' prosocial behavior in the classroom using a single-case multiple-baseline design with four participants. Daily self-reports of stress and coping, as well as student prosocial behavior outcomes were reported by teachers. Baseline data was observed prior to implementing the treatment package. During the treatment package, teachers listened to a 5 min mindful breathing exercise once in the morning and implemented a 5 min body scan with their classroom twice a day (e.g., once in the morning and once in the afternoon) for 10 days.

The treatment package also included weekly fidelity checks by the research assistant accompanied by performance feedback via email from the principal researcher. Teachers provided input on cultural adaptations to the treatment package for social validity purposes. Visual analysis and single-case effect sizes evaluated the functional relationships (across participants) and within-participant effects of the treatment package on teacher stress and coping. Additionally, functional relationships and within-participant effects of the treatment package on teacher ratings of students' classroom prosocial behavior were evaluated. We hypothesized that stress would largely decrease for teachers, that coping would increase for teachers, and that student prosocial behavior in the classroom would increase.

Interpretation of Results

Results did not support a functional relationship between the treatment package and teacher stress and coping across participants. Teacher-implemented MBI reduced stress for 2 of the 4 teachers (e.g., Jessie and Aerith) and improved coping abilities for 2 of the 4 teachers (e.g., Aerith and Tifa). Previous research has shown that MBIs may decrease teacher stress, emotional exhaustion, and burnout (Chang, 2009; Klingbeil & Renshaw, 2018; von der Embse et al., 2019). The mixed results could be a result of the MBI exercise used (e.g., mindful breathing) and the brief amount of time that was required (e.g., 5 min). Further, teachers may have felt bored from using the same exercise every day or may not have fully paid attention to the exercise. The mixed results in teacher coping abilities may also be a result of years of experience teaching. Teachers who had over 7 years of experience seemed to have higher levels of coping generally when compared to baseline. Overall, the results indicate that the treatment package

worked to decrease stress and coping for some teachers. Although we do not conclude that there is a functional relationship between the treatment package and teacher stress and coping, there is evidence to suggest it may be effective for some teachers.

Results did support a functional relationship between the treatment package and improvements in student prosocial behavior in the classroom. Results indicated that the treatment package had small yet desirable effects on students' academic engagement, respectful behavior, and disruptive behavior in the classroom for 3 of 4 teachers (e.g., Aerith, Cloud, and Tifa had improvements in all three prosocial behavior outcomes). To date, there have been few studies looking at the indirect effects of teacher-implemented MBIs with school-age children (Caldwell et al., 2019). The small effect size for classroom prosocial behavior may be due to how engaging teachers were during the MBI classroom implementation. For this study, teachers were given the autonomy of how much they wanted to engage students at the end of each mindfulness intervention by asking students how they felt after the mindfulness exercise. We noticed that one teacher (Aerith) who gave time at the end for students to unpack their feelings without rushing through yielded better results for prosocial behavior compared to teachers who asked students to give a thumbs up or thumbs down to indicate how they felt. Another potential explanation for the increase in student prosocial behavior may be that MBIs are more efficacious when teachers deliver the intervention compared to non-teachers (Waters et al., 2015). However, a more recent meta-analysis found that there was no difference in outcomes when teachers or non-teachers administered MBIs. Related to this, more research is needed to compare the direct effects of teacher-implemented MBIs with non-teachers. Another explanation for the increase in prosocial behavior may be a result of the

cultural adaptations that were made to fit each individual classroom. Studies have shown that cultural adaptations to evidence-based interventions can lead to improvements in various student outcomes (Barrera et al., 2017; Durlak & DuPre, 2008). Perhaps the increase in student prosocial behavior may result from the flexibility that teachers were given to make cultural adaptations prior to and during implementation of the treatment package.

Results showed that the treatment package had strong social validity. All the teachers who participated in this study had favorable impressions of the treatment package during pre-intervention and post-intervention. Jessie and Cloud had favorable, but slightly attenuated perceptions of social validity post intervention. However, Aerith and Tifa had more favorable perceptions of social validity post-intervention. We found that those with more teaching experience (e.g., Aerith and Tifa) thought the treatment package to be more feasible compared to those with 5 years of experience or lower (e.g., Jessie and Cloud). There have been very few studies investigating the feasibility and social validity of MBI with teachers given the resource constraints and lack of environmental supports (Sanetti & Kratochwill, 2009, Wilczynski, 2017). However, similar to our findings, several studies found that feasibility and social validity of MBI are feasible, acceptable, and well-received (Buchan et al., 2019; Kim et al., 2019; Klatt et al; 2013; Roberts, 2020). A major contribution to this may be a result of the proactive nature in asking teachers to directly rate intervention feasibility and social validity before and after implementation. Understanding the teachers' perception of what is feasible and the potential barriers to implementation allowed for appropriate adjustments throughout

the treatment package. As a result, the flexibility to make intervention adjustments may have contributed to strong post-treatment social validity for teacher-implemented MBIs.

Results indicated that the treatment package was implemented by teachers with high fidelity. Teachers had high self-implementation fidelity with a 98% average and high implementation fidelity with a 97% average according to the research assistant's fidelity checks. Further, teachers report of self-practice had high fidelity with a 99% average. Both the self-practice and classroom-implementation were reported with high fidelity by teachers. This is the first known study to examine fidelity to teacher-implemented MBIs in a classroom setting. Our findings indicating high teacher fidelity may be a result of having teachers self-monitor their fidelity daily with the end-of-day questionnaire. This self-monitoring technique may have served as a daily reminder as well as influenced teacher behavior on implementing the intervention correctly. Further, we had a research assistant implementing field fidelity checks three times a week, which may have also contributed to the high fidelity. When paired with the performance feedback that was provided to the teachers after each fidelity check, this may have also contributed to the high fidelity. The use of performance feedback has been well documented as an effective support for teacher implementation and fidelity in classroom settings (Reinke & Martin, 2007; Reinke & Merrell, 2008; Solomon et al., 2012; Stormont & Reinke, 2014).

Study Limitations and Future Directions

Given the brief and pilot nature of this study, several limitations should be noted when interpreting and generalizing the results. Most notably is the lack of ability to measure the quality of classroom MBI implementation. Although fidelity was measured,

the quality (e.g., tone, enthusiasm) of delivery was not captured for this study. Quality has been shown to be an important factor in achieving high implementation fidelity (Carroll et al., 2007). This may have affected the students' level of engagement, which may have affected the classroom prosocial outcomes. Future research might focus on the fidelity of mindfulness intervention as well as quality to demonstrate teacher competence with intervention delivery.

Another limitation from this study is the use of teacher-report for stress and coping outcomes as well as student prosocial behavior. Although convenient, the use of self-report is limited due to potential response bias. Teachers sometimes forgot to fill out the end-of-day questionnaire the day of, so the researcher had to remind them the day after. This happened twice with Jessie and once with Aerith. Since teachers had to retroactively think back on the previous day, the report might not be as accurate. Relatedly, it is difficult to gauge how focused the teachers were during their self-practice. Given that it was implemented in the morning, there may have been distractions that may have made it difficult to fully focus on the meditation. Future studies may include multiple methods of evaluation such as subjective self-reports, behavioral observations, objective neurocognitive and physiological testing) to get more accurate outcomes for teachers and students (Phan et al., 2022).

There are also significant limitations in using the same script to deliver classroom MBI. Given the various ages of the students in the classrooms involved, the teachers observed that the younger students' (grades 2–3) seemed to enjoy this script more than the older students (grade 5). Even though it is important to consider standardization for research purposes, future studies should pay attention to the developmental level of the

classroom and adjust the language and metaphors where needed. Students also expressed their boredom of hearing the same script after 3 days of MBI implementation. To address these limitations, we recommend that different scripts as well as mindfulness exercises (e.g., body scan, mindful breathing, walking) are provided as alternatives to keep students engaged. A preference assessment procedure might even be introduced, which could allow the classroom to choose which mindfulness exercise (among several options) they wished to engage with during each implementation occasion.

Another limitation to this study is the quality of follow-up evaluation data, given that we only collected one data point after one month of implementation for post-intervention results. It is difficult to know whether MBIs have long-term benefits without having more than one data point. Follow up observations for academic engagement showed that it increased after treatment for Jessie, stayed the same for Tifa, and declined for Aerith and Cloud. Respectful behavior largely maintained for all teachers post-treatment. Disruptive behavior largely increased for Aerith and Cloud, while it decreased for Jessie and Tifa. Future studies should consider including post-intervention follow-ups after one month, three months, and six months to gauge for long-term benefits.

Based on the framework provided by Creswell and Creswell (2017), this study may have also incurred threats to internal validity related to selection and mortality. Regarding selection, participants who are interested in participating may be predisposed to mindfulness practice. This could make it challenging to determine if buy-in would be generalizable to other participants who are not familiar with mindfulness practice. Additionally, the one teacher who dropped out of the study after 13 days of baseline data collection (due to a family emergency) suggests unknown outcomes for their classroom.

Threats to external validity may include the interaction of setting and treatment. Given that teachers were recruited in one school district, results may not be generalizable to individuals in other settings. Related to classroom demographics in the targeted district, the majority of the students are White, which may also affect generalizability of the results. In terms of construct validity, the modifications made in the URP-IR Scale could have potential consequences as a result of item removal from the original scale. Relatedly, the URP-IR scale had three questions for the System Supports section. One question was accidentally ommited when creating the survey, so our data only reflects two questions related to System Supports, which may deteriorate the quality of results for this specific subscale.

Conclusion

The purpose of this study was to examine the effects of a teacher-implemented MBI on their stress and coping as well as on teachers' perceptions of students' prosocial behavior in the classroom using a single-case multiple baseline design with four participants. Results did not support a functional relationship between the treatment package an teacher stress and coping across participants. However, results did support a functional relationship between the treatment package and improvements in prosocial behavior (e.g., academic engagement, respectful behavior, disruptive behavior) in the classroom. Further, the treatment package of self-practice and classroom-based implementation had strong social validity and high implementation fidelity. Future studies may focus on the quality of mindfulness intervention to demonstrate teacher competence as well as multiple methods of evaluation to get more accurate outcomes for teachers and students. It may also be helpful to have different mindfulness exercises to

increase teacher and student engagement. Further, future studies should consider including post-intervention follow-ups for longer durations to gauge for long-term benefits. This study demonstrated the potential benefits of MBI practice for students and teachers, although much more research is needed to understand the mixed results. We hope that this study encourages researchers to engage in MBIs to promote teacher and student wellbeing in school settings.

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Table 1

Aggregated Classroom Demographics by Percentage of Students

Demographic Characteristic	Jessie %	Aerith %	Cloud %	Tifa %
Sex				
Male	49	43	54	46
Female	51	57	46	54
Race/Ethnicity				
Asian	0	14	1	0
Black or African American	0	0	0	1
Hispanic	10	10	3	4
Pacific Islander	5	0	0	0
White	85	76	96	95
Free or reduced lunch	52	52	59	68

Table 2

Intervention Effect Sizes for Dependent Variables

Dependent Variable	Jessie		Aerith		Cloud		Tifa	
	IRD	NAP	IRD	NAP	IRD	NAP	IRD	NAP
Teacher Outcomes								
Stress	.25	.38	.64**	.84**	.26	.53*	.05	.49
Coping	.25	.41	.27	.57*	.05	.32	.43*	.69**
Classroom Outcomes								
Academic	.55**	.80**	.27	.59*	.26	.63*	.24	.57*
Respectful	.25	.44	.39*	.71**	.16	.54*	.14	.51*
Disruptive	.25	.26	.64**	.86**	.16	.56*	.43*	.70**

* small effect size, ** medium effect size
Note. IRD = Improvement Rate Difference, NAP = Nonoverlap of All Pairs.

Table 3

Descriptive Statistics for Teachers' Daily Ratings Across Phases

Dependent Variable	Jessie BL *M*	Jessie TX *M*	Aerith BL *M*	Aerith TX *M*	Cloud BL *M*	Cloud TX *M*	Tifa BL *M*	Tifa TX *M*
Teacher Outcomes								
Stress	8.0	7.3	5.6	4.3	6.0	6.0	7.1	7.2
Coping	4.8	4.4	5.7	6.0	5.8	4.7	6.5	7.3
Classroom Outcomes								
Academic	5.2	6.1	6.9	7.1	4.4	5	7.2	7.9
Respectful	6.8	6.5	7.4	7.9	4.6	4.8	7.6	7.9
Disruptive	5.8	4.7	5.4	4.2	5.9	5.6	4.5	3.2

Note. BL = Baseline, TX = Treatment package, *M* = mean

Table 4

Pre and Post Teacher Social Validity Average-Item Ratings

URP-IR Scale	Jessie		Aerith		Cloud		Tifa	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Acceptability	5.8	5.2	4.8	5.0	5.4	5.0	5.2	6.0
Understanding	6.0	5.6	5.0	5.0	5.0	6.0	5.0	6.0
Feasibility	6.0	5.0	5.0	5.0	6.0	5.5	5.3	6.0
System Climate	6.0	5.8	4.8	5.0	5.8	5.8	5.6	6.0
System Support	1.5	1.5	3.5	3.0	1.5	3.5	3.5	1.0

Note. URP-IR = Usage Rating Profile-Intervention Revised

Figure 1

Teachers' Daily Ratings of Stress
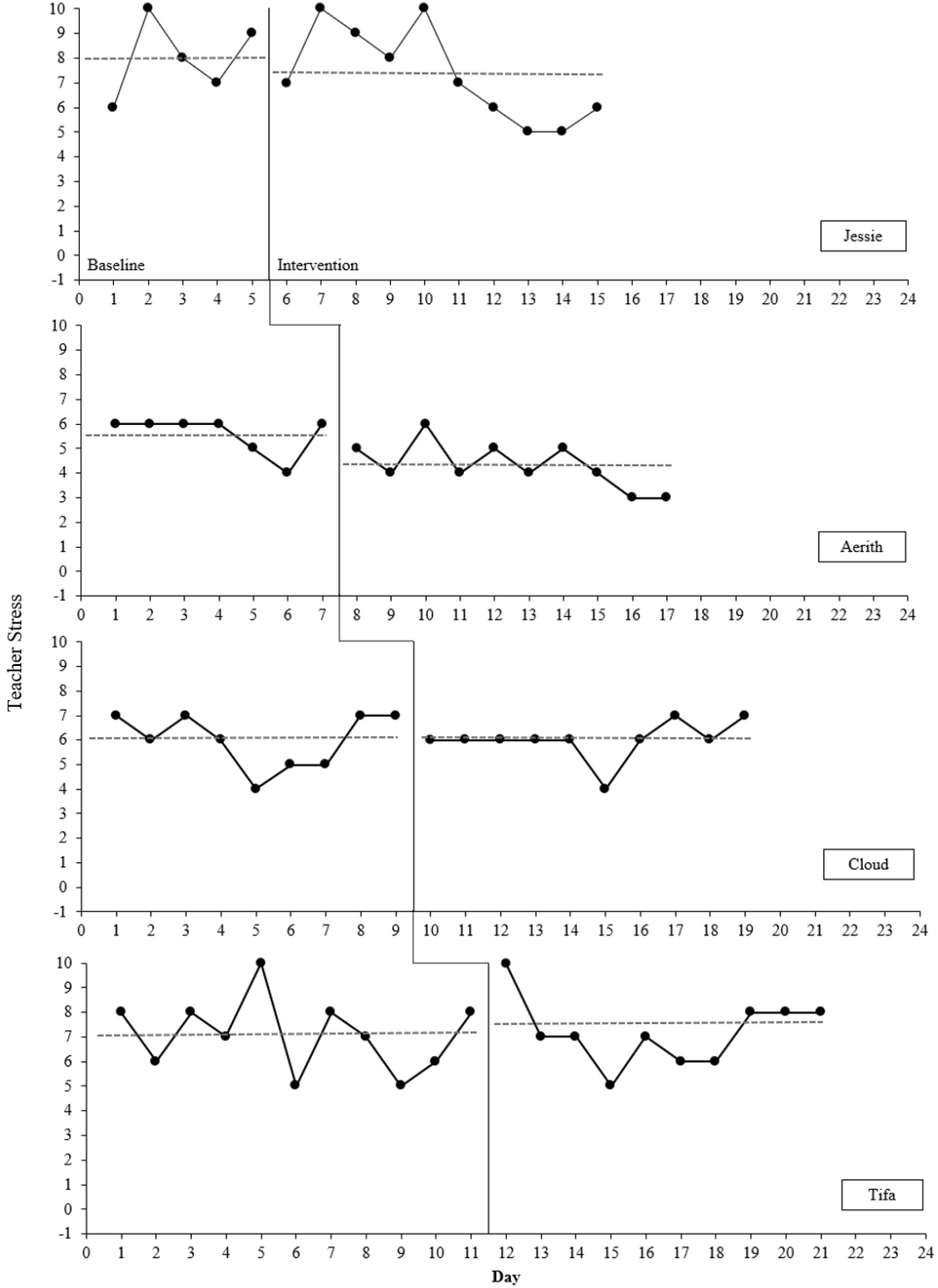
Note. Dashed lines represent mean trends for all data points within each phase.

Figure 2

Teachers' Daily Ratings of Coping
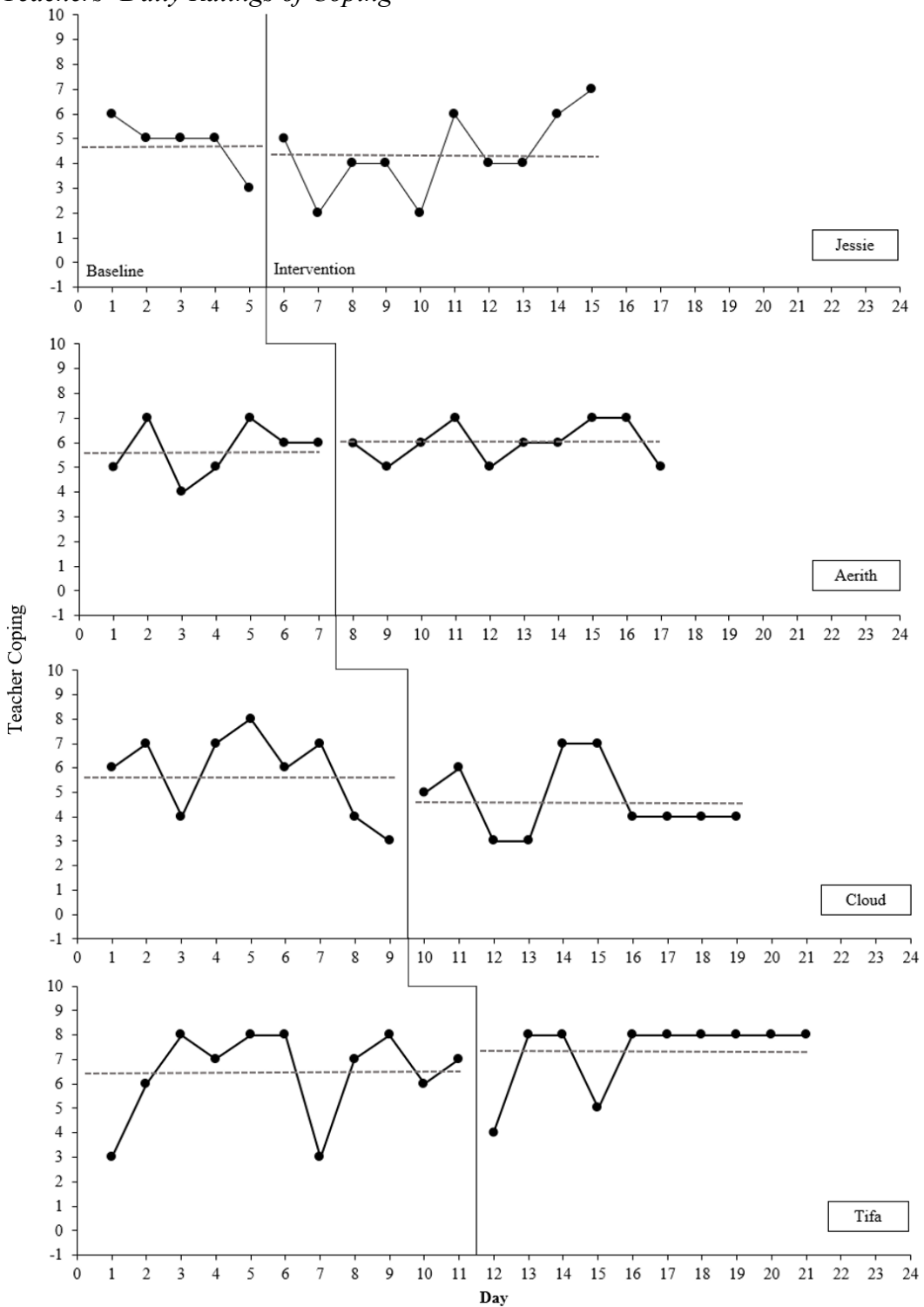
Note. Dashed lines represent mean trends for all data points within each phase.

Figure 3

Teachers' Daily Ratings of Academic Engagement
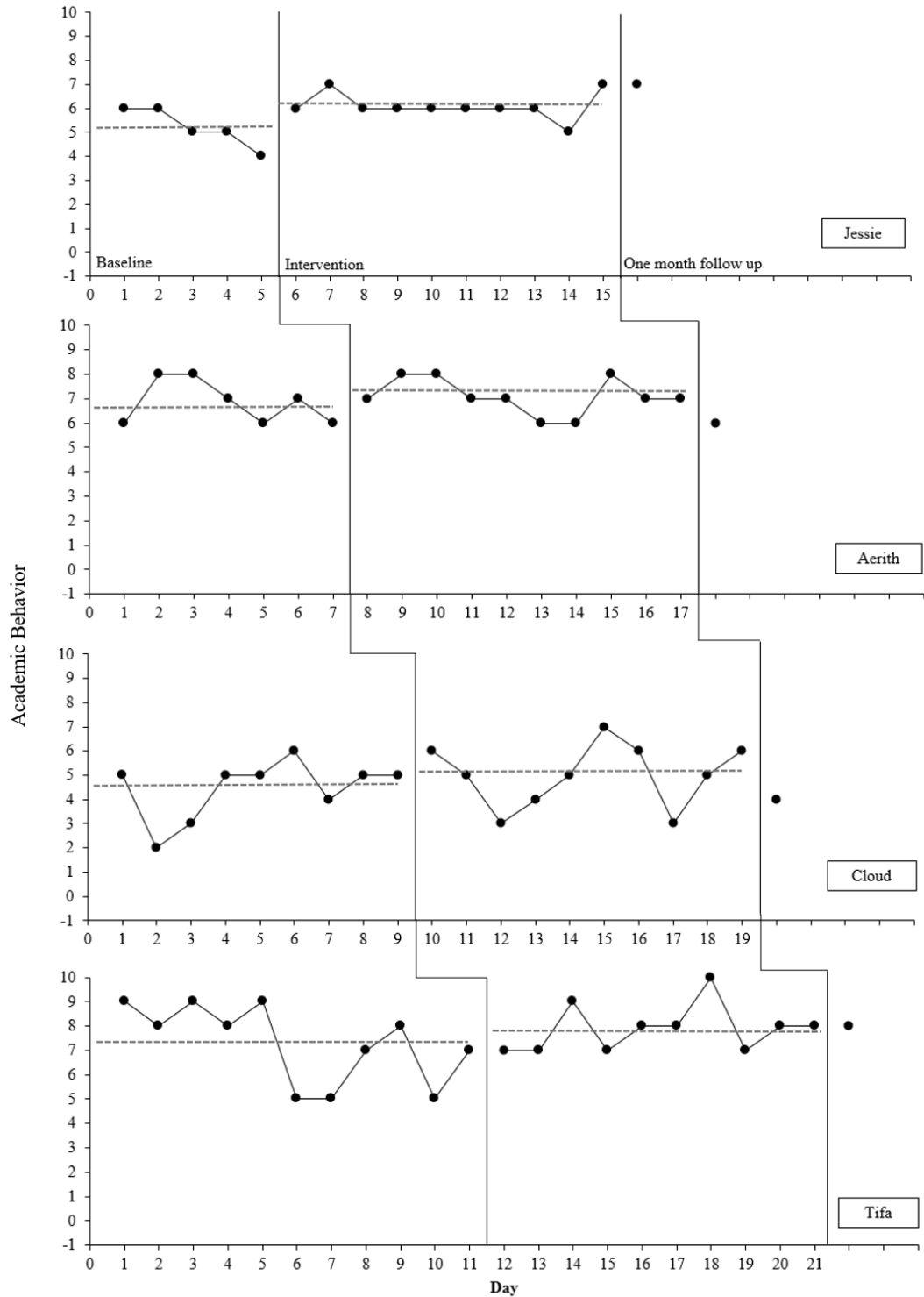
Note. Dashed lines represent mean trends for all data points within each phase.

Figure 4

Teachers' Daily Ratings of Respectful Behavior
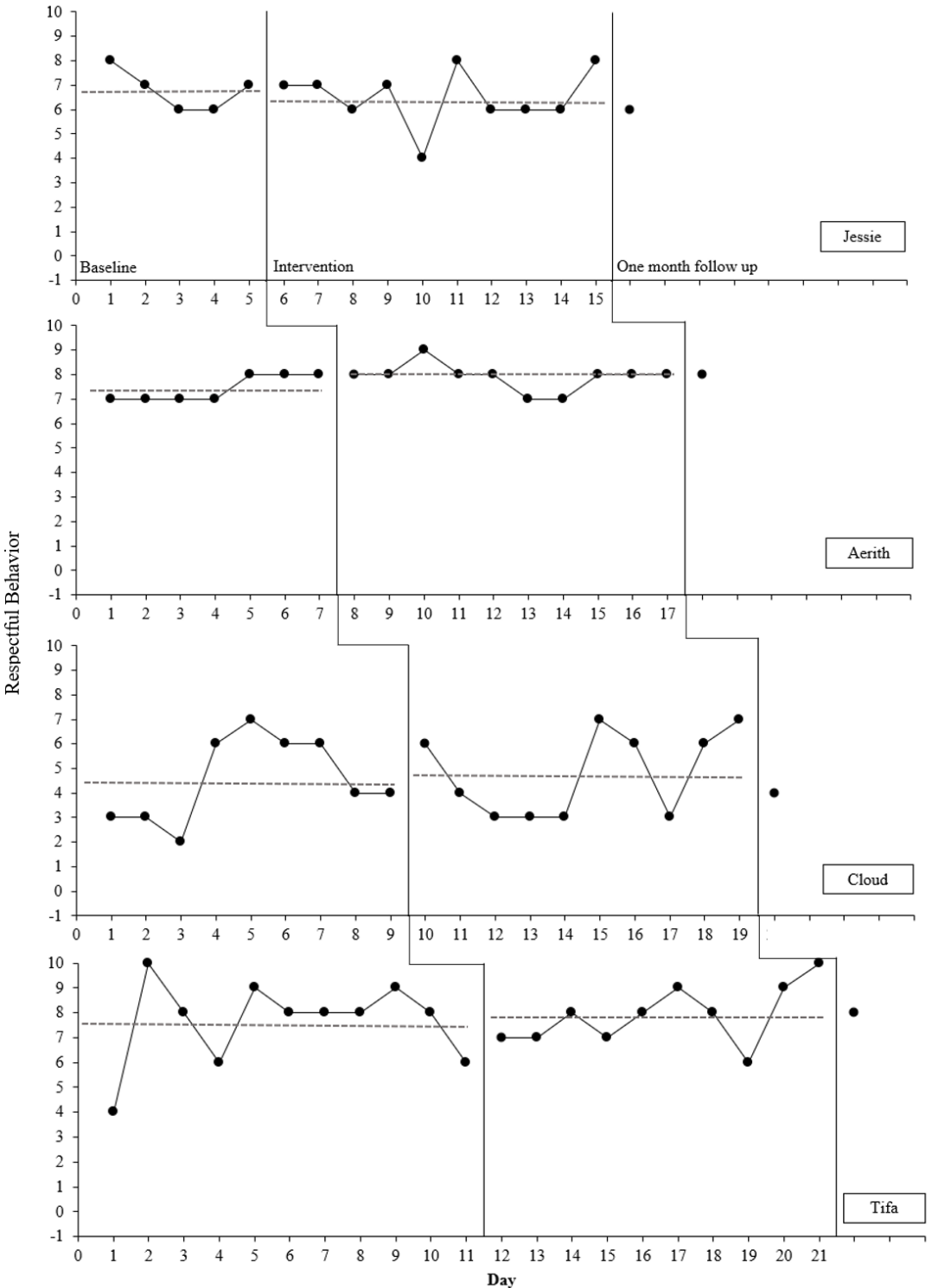
`   *Note.* Dashed lines represent mean trends for all data points within each phase.

Figure 5

Teachers' Daily Ratings of Disruptive Behavior
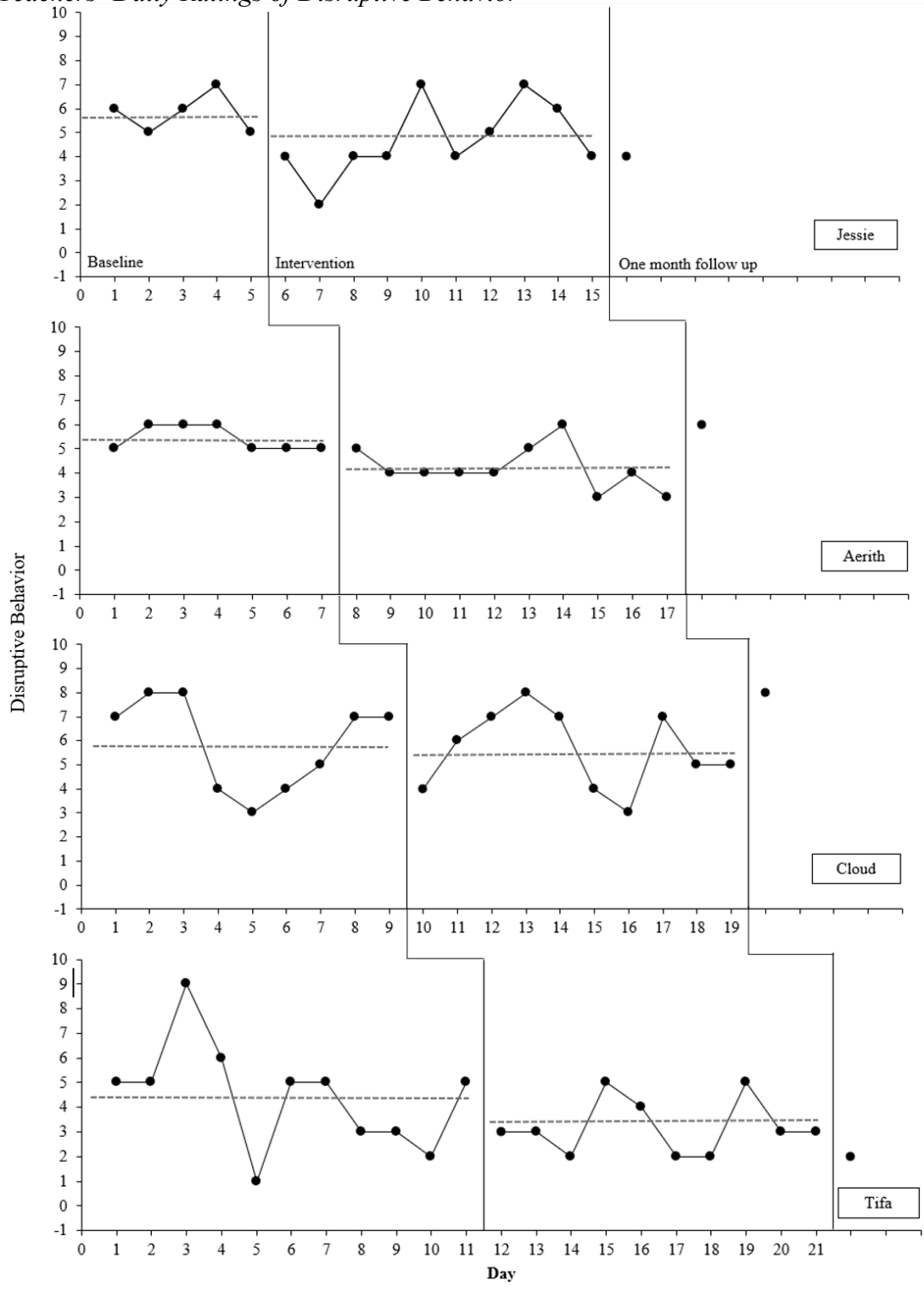
Note. Dashed lines represent mean trends for all data points within each phase.

Appendix A

Proposed Timeline for Implementation Phases Across Participants

Teacher 1

| Baseline | | Treatment Package | | Post-intervention | | Post-intervention |
| 5 days | | 2 weeks | | After 2 weeks | | After 1 month |

Teacher 2

| Baseline | | Treatment Package | | Post-intervention | | Post-intervention |
| 7 days | | 2 weeks | | After 2 weeks | | After 1 month |

Teacher 3

| Baseline | | Treatment Package | | Post-intervention | | Post-intervention |
| 9 days | | 2 weeks | | After 2 weeks | | After 1 month |

Teacher 4

| Baseline | | Treatment Package | | Post-intervention | | Post-intervention |
| 11 days | | 2 weeks | | After 2 weeks | | After 1 month |

Teacher 5

| Baseline | | Treatment Package | | Post-intervention | | Post-intervention |
| 13 days | | 2 weeks | | After 2 weeks | | After 1 month |

Appendix B

Recruitment Flyer

We need your help!

UtahStateUniversity

I am a graduate student from Utah State University. I study mindfulness and its impact on teacher stress and student behavior.

I work with teachers in the schools to help with student classroom behavior, so I am always trying to find new ways to help.

However, **I need your help and expertise** in the classroom to help more teachers like you.

How can you help?

Please consider participating in a mindfulness study in your classroom!
You are eligible if:
- You are a general education teacher from grades 1-5
- You meet criteria based on a stress screener and student behavior screener
Study overview:
- 1-hour personal, virtual training on mindfulness, practice of the mindfulness script (provided), demographic survey and questionnaires post-training
- Daily mindfulness practice (5 mins) before the start of class for ~2-4 weeks*
- Daily implementation of two 5-minute mindfulness exercise in the classroom for ~2-4 weeks*
- Completion of brief survey (~5-10 mins to complete) at the end of each day for ~2-4 weeks*
- A brief questionnaire after study completion (~5-10 mins to complete)
- A brief check-in two weeks after study completion and additional questionnaire after 1 month (~5 mins to complete)

Teachers are paid up to $300 for participating

Please reach out to Mary Phan if you are interested in participating in this study at
mary.phan@usu.edu

*Study participation may be shortened or extended depending on teacher progress

Appendix C

Teacher Instruction and Classroom Script

Day 1 [first time introducing mindfulness]

Before reading script

Good morning class. We are going to practice mindfulness for the next two weeks. You might be wondering what is mindfulness? Mindfulness is about noticing what is happening right now and taking notice of how your body feels and what you see, smell and taste. Maybe you even feel emotions in your body, maybe through a tightness somewhere, or a good sensation. Mindfulness is also noticing what your mind is doing. Practicing mindfulness could help us pay attention better, be less distracted, learn more, stay calm under stress, be more patient, get along better, feel happier, listen better to others, and much more. For the next few minutes, we will listen to me read a mindfulness exercise.

<read script>

Script (adapted from Your Special Star, a guided visualization for young children by Susan Kaiser Greenland)

So, let's sit comfortably in our chairs and let's zip ourselves up so we are sitting nice and straight, one hand in front, one hand in back, ZIP. Other hand in front, other hand in back, ZIP. Hands on your knees. Sitting up nice and straight because we zipped ourselves up, feel free to keep your eyes open or closed. Let's imagine that a star is in the sky right now and you can feel its warm light on your body. Imagine what your skin feels like when it's bathed in the warm light of your own special star. [pause 3 seconds]. Feel the warmth on the top of your head [pause], now on your forehead [pause], now over your ears [pause], onto your cheeks [pause], your nose [pause], your whole face [pause], your chin [pause]. Even your neck, it's all nice and warm with the light from your special star. Now that light is going to keep moving and getting bigger and the warmth is going to move down your shoulders and get bigger to include your chest, and your arms, and your hands, and even your fingers. Now the warmth from the light of your own special star is moving into your middle, into your lower body, it's warming up your upper legs, your knees, your lower legs, your feet, and even your toes. Wow it feels so good to feel bathed in the light on my own star, how about you? You know when I'm sitting here bathed in the light of my own special star, it just feels so good to just be me. Let's try it one last time. Let's imagine that we can see our stars and feel their warmth covering our whole bodies just like a cozy blanket. Imagine *really* imagine *really* feel what that is like. Now imagine the warmth from your star like that blanket is softly falling against your skin. It relaxes your whole body so you can rest. Slowly start to wiggle your toes and fingers and open your eyes whenever you are ready.

After reading script

Ask students: How did you feel when we were doing that mindful exercise?

Day 1 afternoon practice - Day 10

Before reading script

Good morning/afternoon class. We are going to continue with the same mindfulness practice. Again, mindfulness is about noticing what is happening right now and this helps us pay attention better, be less distracted, learn more, stay calm under stress, be more patient, get along better, feel happier, listen better to others, and much more. For the next few minutes, we will listen to my recording of a mindfulness exercise.

<read script>

Script (adapted from Your Special Star, a guided visualization for young children by Susan Kaiser Greenland)

So, let's sit comfortably in our chairs and let's zip ourselves up so we are sitting nice and straight, one hand in front, one hand in back, ZIP. Other hand in front, other hand in back, ZIP. Hands on your knees. Sitting up nice and straight because we zipped ourselves up, feel free to keep your eyes open or closed. Let's imagine that a star is in the sky right now and you can feel its warm light on your body. Imagine what your skin feels like when it's bathed in the warm light of your own special star. [pause 3 seconds]. Feel the warmth on the top of your head [pause], now on your forehead [pause], now over your ears [pause], onto your cheeks [pause], your nose [pause], your whole face [pause], your chin [pause]. Even your neck, it's all nice and warm with the light from your special star. Now that light is going to keep moving and getting bigger and the warmth is going to move down your shoulders and get bigger to include your chest, and your arms, and your hands, and even your fingers. Now the warmth from the light of your own special star is moving into your middle, into your lower body, it's warming up your upper legs, your knees, your lower legs, your feet, and even your toes. Wow it feels so good to feel bathed in the light on my own star, how about you? You know when I'm sitting here bathed in the light of my own special star, it just feels so good to just be me. Let's try it one last time. Let's imagine that we can see our stars and feel their warmth covering our whole bodies just like a cozy blanket. Imagine *really* imagine *really* feel what that is like. Now imagine the warmth from your star like that blanket is softly falling against your skin. It relaxes your whole body so you can rest. Slowly start to wiggle your toes and fingers and open your eyes whenever you are ready.

After reading script

Ask students: How did you feel when we were doing that mindful exercise?

Appendix D

Research Procedure

Recruitment	• Recruit teachers • Introduce study to principals • Recruit eligible teachers via email • Administer Perceived Stress Scale (PSS) and Direct Behavior Rating (DBR) scale to teachers
Baseline	• Administer DBR scale, Single-item Teacher Stress and Coping Measure
MBI Training **(Compensation: $75)**	• One hour training with individual teachers • Administer Usage Rating Profile-Intervention Revised (URP-IR) pre intervention and cultural adaption questions to teachers
MBI Week 1 **(Compensation: $50)**	• Administer DBR scale, Single-item Teacher Stress and Coping Measure, and fidelity questions • Random in-person fidelity observation conducted by research assistant
MBI Week 2 **(Compensation: $50)**	• Administer DBR scale, Single-item Teacher Stress and Coping Measure, and fidelity questions • Random in-person fidelity observation conducted by research assistant
End of intervention **(Compensation: $25)**	• Administer Usage Rating Profile-Intervention Revised (URP-IR) post-intervention
2 Week Follow-Up **(Compensation: $25)**	• Check in with teacher to see if they are still doing the intervention • "Are you still using the treatment package? Why or why not?", "How often are you using the treatment package?", "What modifications did you make to the treatment package, if any?"
Post-intervention **(Compensation: $25)**	• "Are you still using the treatment package? Why or why not?", "How often are you using the treatment package?", "What modifications did you make to the treatment package, if any?" • Administer DBR Scale
Bonus **(Compensation: $50)**	• Bonus compensation if all measures are completed in the study

Appendix E

Cultural Adaptation Questions

1. *Language* – Is the wording in the intervention acceptable to you? In other words, does it make sense in this context? Yes / No (if no, probe further)
2. *Persons* – Do you think your students would enjoy listening to your voice for the intervention or would it be better to use another adult's voice/student voice? Yes / No (if no, probe further)
3. *Metaphors or examples* – Do you think the metaphors used in this mindfulness intervention reflect the folktales and symbols of your classroom? Yes / No (if no, probe further)
4. *Content* – [Part 1] If you find that this intervention is not fitting your classroom culture, would you add new content that reflects knowledge of and sensitivity to the values, customs, traditions, and typical experiences of your classroom? [Part 2] Do you think the content of the intervention is relevant for your students' cultures of origin? Yes / No (if no, probe further)
5. *Concepts*- Are there changes to the wording of the script that would make this mindfulness intervention more relevant to your classroom? Yes / No (if no, probe further)
6. *Goals*- [Part 1] Do you think the goal of this intervention is a value to your classroom? [Part 2] What are you hoping to get out of this? Open text box
7. *Methods* – Do you think reading a script of the mindfulness intervention is the most effective way to practice mindfulness in your class? Yes / No (if no, probe further)
8. *Context* – Thinking about your students' life circumstances, do you think the effects of this mindfulness intervention could be helpful with these circumstances? Yes / No (if no, probe further)

Appendix F

Transcript for Self-Guided Meditation

UCLA Semel Institute
Mindful Awareness Research Center

Breathing Meditation (5:31)

Find a relaxed, comfortable position
Seated on a chair or on the floor, on a cushion
Keep your back upright, but not too tight
Hands resting wherever they're comfortable
Tongue on the roof of your mouth or wherever it's comfortable.
And you can notice your body
From the inside
Noticing the shape of your body, the weight, touch
And let yourself relax
And become curious about your body
Seated here
The sensations of your body
The touch
The connection with the floor
The chair
Relax any areas of tightness or tension
Just breathe
Soften
And now begin to tune into your breath
In your body
Feeling the natural flow of breath
Don't need to do anything to your breath
Not long not short just natural
And notice where you feel your breath in your body
It might be in your abdomen
It may be in your chest or throat
Or in your nostrils
See if you can feel the sensations of breath
One breath at a time
When one breath ends, the next breath begins
Now as you do this you might notice that your mind might start to wander
You might start thinking about other things
If this happens this is not a problem
It's very natural

Just notice that your mind has wandered
You can say "thinking" or "wandering" in your head softly
And then gently redirect your attention right back to the breathing
So we'll stay with this for some time in silence
Just a short time
Noticing our breath
From time to time getting lost in thought and returning to our breath
See if you can be really kind to yourself in the process
And once again you can notice your body, your whole body, seated here
Let yourself relax even more deeply
And then offer yourself some appreciation
For doing this practice today
Whatever that means to you
Finding a sense of ease and wellbeing for yourself and this day
[bell rings]

Appendix G

Research Assistant Fidelity Check

*Today's date

*Teacher's name

*Start time (am/pm)

*1. To what extent did the teacher talk about mindfulness and its benefits before starting the intervention? If "somewhat", explain why. (See example below).

○ Not at all

○ Somewhat
_____

○ Totally

Example for *somewhat*: Teacher says they are about to start intervention but doesn't explain what it is or mention benefits; mentions some benefits but not all; omits 1-2 sentences from this section.

*2. To what extent did the teacher read the script close to/exactly like the script with appropriate pauses? If "somewhat", explain why. (See example below).

○ Not at all

○ Somewhat
_____

○ Totally

Example for *somewhat*: Teacher skips the "ZIP" motion; pauses sometimes, but not all the time; rushes through the intervention; omits 1-2 sentences from this section.

*3. To what extent did the teacher ask the students how they felt after the mindfulness exercise? If "somewhat", explain why. (See example below).

○ Not at all

○ Somewhat

_____

○ Totally

Example for *somewhat*: If the teacher rushes through, doesn't respond to students, etc.

*End time (am/pm)

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│   │
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Appendix H

End of Day Questionnaire

1. How academically engaged was your class today? 0% (never) to 100% (always)
2. How respectful was your class today? 0% (never) to 100% (always)
3. How disruptive was your class today? 0% (never) to 100% (always)
4. Did you listen to the 5-minute meditation exercise prior to starting class today? (yes/no)
5. Did you tell your classroom about mindfulness and the benefits of practicing [located under "before reading script" in the script]? (yes/no)
6. Did you read the entire mindfulness exercise for your classroom today word for word? (yes/no)
7. Did you ask your students how they felt after the mindful exercise [located under "after reading script" in the script]? (yes/no)
8. How stressful is your job? 0 (not stressful) to 10 (very stressful)
9. How well are you coping with the stress of your job right now? 0 (not well) to 10 (very well)
10. Any questions, feedback, or modifications added to the intervention? Open text box

Appendix I

Usage Rating Profile-Intervention Revised (URP-IR) Pre- and Post- Intervention

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	agree	Strongly agree
1. This intervention seems like an effective choice for addressing a variety of problems.	1	2	3	4	5	6
2. I might need additional resources to carry out this intervention	1	2	3	4	5	6
3. I would be able to allocate my time to implement this intervention.	1	2	3	4	5	6
4. I understand how to use this intervention.	1	2	3	4	5	6
5. The intervention is a fair way to handle the student's behavior problem.	1	2	3	4	5	6
6. I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
7. The total time required to implement the intervention procedures would be manageable.	1	2	3	4	5	6
8. I would not be interested in implementing this intervention.	1	2	3	4	5	6
9. My administrator would be supportive of my use of this intervention.	1	2	3	4	5	6
10. I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6

11. Preparation of materials needed for this intervention would be minimal.	1	2	3	4	5	6
12. Use of this intervention would be consistent with the mission of my school.	1	2	3	4	5	6
13. Implementation of this intervention is well matched to what is expected in my job.	1	2	3	4	5	6
14. Material resources needed for this intervention are reasonable.	1	2	3	4	5	6
15. I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
16. This intervention is too complex to carry out accurately.	1	2	3	4	5	6
17. These intervention procedures are consistent with the way things are done in my system.	1	2	3	4	5	6
18. This intervention would not be disruptive to other students.	1	2	3	4	5	6
19. I would be committed to carrying out this intervention.	1	2	3	4	5	6
20. The intervention procedures easily fit in with my current practices.	1	2	3	4	5	6
21. This intervention is a fair way to decrease the student's stress.	1	2	3	4	5	6
21. I would need consultative support to implement this intervention.	1	2	3	4	5	6

22. I understand the procedures of this intervention.	**1**	**2**	**3**	**4**	**5**	**6**
23. My work environment is conducive to implementation of an intervention like this one.	**1**	**2**	**3**	**4**	**5**	**6**
24. The amount of time required for record keeping would be reasonable.	**1**	**2**	**3**	**4**	**5**	**6**
25. I would require additional professional development in order to implement this intervention.	**1**	**2**	**3**	**4**	**5**	**6**
26. The intervention is a good way to decrease the student's behavior problem.	**1**	**2**	**3**	**4**	**5**	**6**

Appendix J

Performance Feedback Email

Good performance feedback:

Hello,

Here is your performance feedback for MM/DD. Overall, you've been doing an excellent job with the mindfulness intervention! You have followed the intervention exactly as it should be. You talked about mindfulness and the benefits of it before starting the intervention. You followed the script close to/ exactly like it was intended while incorporating appropriate pauses. You also asked students how they felt after the mindfulness exercise. Keep up the good work!

Areas of growth performance feedback:

Hello,

Here is your performance feedback for MM/DD. Overall, you've executed great effort with the mindfulness intervention! You have followed the intervention almost as it should be. In terms of talking about mindfulness and its benefits before starting the intervention, this section was (skipped/somewhat implemented. If somewhat: provide context). When it came to reading the script close to/exactly like the script with appropriate pauses, this section was (skipped/somewhat implemented. If somewhat: provide context). Finally, when asking students how they felt after the mindfulness intervention, this section was (skipped/somewhat implemented. If somewhat: provide context).