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EXPLORING THE PROCESS OF MINDFUL BREATHING
WITH STRESSED MOTHERS

by

Caleb D. Farley

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTERS OF SCIENCE

in

Psychology

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2023

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ABSTRACT

EXPLORING THE PROCESS OF MINDFUL BREATHING
WITH STRESSED MOTHERS

by

Caleb Farley, Master of Science

Utah State University, 2023

Major Professor: Tyler Renshaw, Ph.D.
Department: Psychology

Mindfulness is incorporated in a variety of parenting and family interventions designed to decrease stress, improve family functioning, and indirectly improve child wellness, and these mindfulness-based interventions (MBI) are relatively effective at achieving these outcomes. However, critical issues remain related to intervention validation. Specifically, research has yet to demonstrate functional relationships regarding specific mindfulness processes purported to elicit stress reduction and decrease child behavior problems.

The current study conducted a single-case multiple baseline design study aimed at validating theory regarding purported relationships among practicing mindfulness and changes in parents' mindfulness process, wellbeing, and perceptions of child behavior problems.

Results from four mothers showed that mindful breathing had a functional relationship with changes in mindful awareness but not mindful acceptance. Additional findings suggest that mindful breathing had a functional relationship with changes in

wellbeing, including decreased stress and increased happiness. Results did not indicate a clear, functional relationship between mothers' mindful breathing and changes in perception of child behavior problems; however, results suggest parental practice of mindfulness may be more effective at reducing child internalizing problems compared with externalizing problems.

Findings from this study raise critical questions regarding how to advance research in this area, including the usefulness of single-item scales to measure mindfulness processes and wellbeing outcomes, the relationship between decreased parental stress and decreased child behavior problems, and the effectiveness of specific mindfulness exercises for eliciting changes in specified mindfulness processes.

(99 pages)

PUBLIC ABSTRACT

EXPLORING THE PROCESS OF MINDFUL BREATHING
WITH STRESSED MOTHERS

Caleb Farley

Mindfulness exists in many parenting and family interventions and are intended to decrease stress, improve familial relationships, and indirectly improve child wellness, and these mindfulness-based interventions (MBI) are relatively effective at doing so. However, critical issues remain related to designing effective and useful interventions for school-based and other community practitioners. Specifically, research has not demonstrated clear relationships between parent mindfulness practice increasing generalized mindfulness behaviors (i.e., awareness and acceptance), experiencing subsequent parental stress reduction, and reporting decreased behavior problems in children. The current study examined these relationships between practicing mindfulness and experiencing changes in parents' mindfulness process, wellbeing, and perceptions of difficult child behavior problems in four mothers. Results showed that mindful practice was related to changes in mindful awareness but not necessarily mindful acceptance. Mindfulness practice elicited changes in parental wellbeing, including the decreased stress and increased happiness. Results did not indicate clarity between mothers' mindful breathing and perceptions of child behavior problems; however, mothers practicing mindfulness may reduce child internalizing problems compared to externalizing problems. These findings raise questions for advancing research, such as investigating

single-item scales to measure internal experiences and further exploring relationships between decreasing parental stress and influencing various child behavior problems.

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Caleb Farley

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CHAPTER I

INTRODUCTION

Supporting the wellbeing of a student's parent can be a time-consuming and less-necessary focus for school mental health professionals compared to the more urgent, day-to-day needs of students at school. However, supporting student parents can become an indispensable capacity for good in strengthening a student's family mental health and, subsequently, the student's mental health. Research demonstrates that the quality of parent-child relationships significantly affects a child's wellbeing and other outcomes including academic skills, social life, and mental health. For example, Wang et al. (2019) indicated that higher levels of student-perceived parental involvement in middle schoolers was correlated with lower levels of mental-health difficulties, peer victimization, and suicidal thoughts and behaviors. Fan and Chen (2001) showed that children with positive academic outcomes often had parents who were actively involved with the child's schoolwork. El Nokali et al. (2010) demonstrated that active parental involvement and awareness of their child's life led to better social outcomes in their children. Altogether, if a parent might become more present-focused and actively involved in a child's life, the child might receive a greater chance at succeeding academically, mentally, and socially.

One experience that can negatively impact a parent's present-focus with their child, and subsequently decrease the child's mental health, is the existence of significant parental stress (Lucas-Thompson et al., 2020). Parent stress can be defined as feeling burdened by, overwhelmed in, or tired from the responsibility as a parent. This type of stress is correlated with innumerable problems across individuals in a family unit,

including depression, anxiety, insomnia, conflict, health complications, and relational discord, which can specifically affect parents and indirectly affect their children (Lucas-Thompson et al., 2020). Research specifically shows that high parent stress is correlated with significant negative behaviors in the child, including increased behavior problems, decreased emotional dysregulation, and various forms of internal and external psychopathology (Chan & Neece, 2018; Lucas-Thompson et al., 2020). Notably, a meta-analysis by Shalev et al. (2020) demonstrates that parental stress may moderate the severity of child behavioral problems related to autism.

Decreasing parent stress may therefore have a variety of positive effects on increasing a youth's wellbeing. Shalev et al. (2020) demonstrated that parents with lower stress levels became more adherent to behavior training guidelines and more open and responsive to their children's needs. Moreland and Apker (2016) showed that decreased stress in parents led to increased feelings of stability across the entire family unit and, specifically, decreased behavior problems in the children. McGregor et al. (2020) demonstrated that parents engaging in a stress-reduction program reported decreased feelings of stress overtime, which was associated with decreased measures of child internalizing problems. McGregor et al. (2020) reported that increased acting in nonjudgmental awareness taught from a stress-reduction exercise mediated a decrease in child internalizing problems. Ward and Lee (2020) showed that decreased stress in caregivers led to a greater responsiveness toward their children, which ultimately led to increased cognitive development and prosocial behavior in the children over time. Daundasekara et al. (2021) demonstrated that increased depression in parents was related to increased depression and anxiety in children. Daundasekara et al. also found that stress

management mediated a relationship in which parents who decreased their stress reported decreased depression, with significant decreases in measured child anxiety and depression occurring as parent stress decreased.

Mindfulness is a common intervention used to decrease stress. Literature demonstrates mild to moderate effectiveness in affecting a variety of desired outcomes (Alexander, 2018; Townshend et al., 2016; Rayan & Ahmad, 2017), but many questions exist regarding the feasibility of interventions in school-based work with families, dose-response relationships, and connections between practicing mindfulness, increasing mindful behavior, and experiencing desired mental health outcomes in parents and their children (Renshaw, 2020). This research is notably valuable in its examination of these relationships, as the following questions were addressed:

1. Does practicing mindfulness daily have a functional relationship with changing certain mindfulness processes?
2. Does practicing mindfulness daily have a functional relationship with changing parental stress and wellbeing outcomes?
3. Does practicing mindfulness daily have a functional relationship with changing parental perceptions of their child's behavior problems?

CHAPTER II

REVIEW OF THE LITERATURE

Mindfulness-based Intervention (MBI)

The philosophy of mindfulness grew from teachings of meditation found in ancient Eastern and Buddhist traditions. Chödrön (2008) explains that mindful meditation entails learning how to be present in the here and now, no matter the situation one might find oneself in. The Tao Te Ching, an ancient book of Taoist scripture, describes the concept of mindfulness by stating “[One] gives [their self] up to whatever the moment brings...[They] have nothing left to hold on to: no illusions in [the] mind, no resistances in [the] body...[One] lets all things come and go effortlessly” (Tzu, 2013, ch. 50, 55). Chödrön (2008) explains that one meditates mindfully when they allow all experiences in the present moment to exist as they are; one fails in mindful meditation when they specifically meditate for the purpose of fixing something or feeling good. Prominent mindfulness teacher Hanh (2011) explains that mindfulness occurs when a person shows up with their mind and body together. When the mind is there with the body, one becomes established in the present moment (Hanh, 2011).

In more recent years, principles of mindfulness meditation from Eastern Buddhist and Taoist teachings were practiced by Western doctors and scientists in the United States and scientifically adapted as mindfulness for clinical use with American hospital patients learning to cope with chronic pain (Kabat-Zinn, 2004). Kabat-Zinn (2004) created the mindfulness-based stress reduction (MBSR) program, which specifically taught hospital patients to develop mindful awareness of their suffering to cultivate a new way of perceiving their pain guided by open, accepting, non-judgmental, and

compassionate awareness of present-moment experiences. As the patients engaged in the MBI, they became more mindful and less resistant against their difficult situations; as a result, stress and symptoms of poor health decreased.

As Western science began studying mindfulness, researchers spent effort in theorizing how MBI promotes stress reduction and mental health within the context of individuals, caregivers, and families. Most notably, research has been done to propose theories about the mechanisms of change underlying the ability of MBI to reduce stress. Renshaw and O'Malley (2014) proposed three core components that exist among most current MBI, which are attentive awareness (i.e., building sustained attention to the stimuli occurring in the present moment), a receptive attitude (i.e., approaching awareness with an attitude of curiosity, openness, acceptance, and self-compassion), and intentionality (i.e., developing sustained attention with acceptance in a deliberate and consistent manner). Burke et al. (2020) argued that acting with awareness, which consists of questions regarding the act of mind wandering, distraction, automatic thinking, and intentionally paying attention to the present moment, was more associated with stress reduction than any other mindfulness-related construct. Additionally, Boekhorst et al. (2020) found that non-reacting to the present moment was the mindfulness-related mechanism mostly strongly associated with less relationship problems between parent and child.

Bishop et al. (2004) and Renshaw (2020) proposed that a true MBI must include developing greater present-moment awareness and responding to this awareness with an attitude of acceptance. Present-moment awareness might be defined as intentionally noticing thoughts and feelings as they occur right now in the present moment, and the

opposite of this behavior might be described as distraction or unawareness of present-moment thoughts and feelings. Responding to present-moment stimuli with an attitude of acceptance might be defined as allowing a noticed experience to exist as it is, regardless of whether the experience is pleasant or aversive. The opposite of the attitude of acceptance might be avoidance or resistance toward experiences. Avoidance might be done through engaging in distracting behaviors intended to avoid experiencing unwanted thoughts, feelings, or experiences. Theoretically, when present-moment awareness and responding with acceptance occur simultaneously (or in close temporal order) toward stressful stimuli or experiences, stress reduction should follow (Renshaw, 2020).

Scientific Status of Current MBI Programs

Since the 1980s, psychological science has continued to conceptualize and redefine the practice of mindfulness as a secular intervention that is applicable for many fields, including education and school-based mental health therapies. For example, principles of awareness of the present moment and responding with acceptance are found in Acceptance and Commitment Therapy, Dialectical Behavior Therapy, Mindfulness-based Cognitive Therapy, and many social-emotional learning (SEL) curricula presented as part of broad mental health skill building for youth in schools (Renshaw & Cook, 2017). MBI targeting youth in schools have proved to be effective for improving a variety of valued student outcomes, including decreased internalizing problems and negative emotion as well as increased mindfulness ability, emotion regulation, wellbeing, academic achievement, school functioning, social competence, prosocial behavior, and even physical health (Klingbeil et al., 2017). MBI have also been effectively applied with teachers in schools, with outcomes showing increased mindfulness ability, greater

psychological wellbeing, increased physiological indicators of health, improved classroom climate, effective instructional practices, and decreased distress (Klingbeil & Renshaw, 2018).

MBI for parental caregivers within a school mental health context is not as frequently used as other forms of MBI in schools targeting students and teachers, but applications in practice are expanding. Not long after MBSR was introduced, mindful parenting became a recognized topic when founder Jon Kabat-Zinn and his wife Myla Kabat-Zinn wrote about mindfulness applied to parenting (Kabat-Zinn & Kabat-Zinn, 1997). While teaching fundamental mindfulness principles of acceptance and nonjudgmental awareness of the present, Kabat-Zinn and Kabat-Zinn (1997) discussed their personal experiences as parents and suggested how other parents might cultivate a more mindful approach toward their parenting. Since this publication, a variety of training programs have become available that are based on Kabat-Zinn and Kabat-Zinn's (1997) principles (Bender et al., in press). Specifically, several after-school MBI programs for parents have been created where parents come to learn and practice mindfulness principles both related to managing stress as parents and sometimes combined with learning behavior management. Some of these programs include the Mindful Awareness for Parenting Stress (Neece, 2014), Mindful Families Stress Reduction (Felver et al., 2014), Mindful Parenting program (Bogels & Restifo, 2014) and Kabat-Zinn's (2004) MBSR specifically adapted for parents (as cited in Bender, in press).

Mindfulness seems promising for improving parent stress, the relationship between children and parents, and the mental health of the child. Kil and Grusec (2020) demonstrated that mothers who were more mindful raised adolescent children who more

frequently reported higher perspective taking, open communication, and less stress as compared to mothers who were less mindful. Boekhorst et al. (2020) found that mothers who were more mindful of their thoughts and experiences had less stress during pregnancy, less stress while raising their toddler, better relationships with their children, and fewer reports of child behavior problems as compared to mothers who were not as mindful. McGregor et al. (2020) demonstrated that increased nonjudgmental awareness in parents produced by an adaptation of Kabat-Zinn's MBSR led to fewer reports of internalizing problems in the parent's children. Indeed, evidence is suggesting that mindful parents might experience less stress and likely foster better relationships with and positive mental health outcomes for their children.

Several meta-analyses and systematic reviews further summarize findings of parent MBI research. Townshend et al. (2016) gathered results of parent mindfulness trainings on mothers and their adolescent children, parents of pre-school children, and parents of children with autism, and they found that mindfulness practiced by the caregiver had small to moderate effects for improving the well-being of both caregiver and their children across several outcomes, including emotional regulation ability, attention strength, resilience ability, mindfulness ability, and relationship qualities between the child and parent. Interestingly, another meta-analysis conducted by Rayan and Ahmad (2017) demonstrated stronger findings. These researchers surveyed MBI studies that examined parents of children with developmental disabilities as the parents engaged in an MBI, and results revealed medium to large effects of the MBI for reducing parent stress across each study. Other reviews such as Alexander (2018), Cachia et al. (2016), Frantz et al. (2018), and Taylor et al. (2016) demonstrate similar findings;

namely, when parents learn and practice mindfulness principles found in MBI, they generally report small effects in decreases of stress and mental health symptoms as well as increased positive relationships with their children and reducing child behavior problems. While mean summaries of the treatment effect sizes across studies were often small, the effect sizes included in these reviews ranged widely from small to large, depending on the study.

Limitations in the MBI Literature

Overall, MBI appear effective in decreasing parental stress and promoting positive relationships between parents and their children. However, it is noteworthy that the effect sizes of reductions in parent stress, depression, anxiety, quality of the parent-child relationship, etc., vary widely from minimal to large, depending on the study. More importantly, some individual studies are less encouraging in their findings of parent MBI with no effective changes shown in stress levels, relationship status between the parent and child, or decreases in other mental health problems as compared to control populations (e.g., Epstein, 2010; Walling, 2008). Occasionally, individual studies included in the reviews have even reported increased parent stress and poorer relationships between the parent and child after participants began to learn mindfulness skills (e.g., Corti et al., 2018). Authors explain that the absence of stress reduction (or increase of stress in some cases) may be due to reasons such as poorly constructed interventions or potentially negative participant experiences while practicing mindfulness (Rayan & Ahmad, 2017). While the literature suggests that MBI for parents is generally helpful, there exists occasions where MBI might not always be helpful and might sometimes have iatrogenic effects. Results such as these suggest that MBI may

sometimes be unpredictable or unreliable in their ability to decrease parent stress and improve wellbeing. This is an issue of concern for school mental health professionals who strive to adhere to evidence-based interventions.

Nock (2007) argues that designing stronger, more predictable interventions first requires empirical research understanding the intervention's mechanism of change. This research goal is different from the typical goals of a randomized controlled trial, which is intended to demonstrate predictors of behavior change but not the path through which behavioral change occurs (Nock, 2007). For instance, the several available randomized control trials of MBI programs with parents cannot demonstrate the mechanism of how, when, and where the mindfulness intervention decreased stress in parents nor improved child behavior as they participated in the intervention.

More specifically, Nock (2007) states that one area of mechanism research entails identifying temporal relationships between variables involved in behavior change. In other words, research must examine if specific behaviors or processes must come before other behaviors or processes to maximize the effectiveness of an intervention. In the case of MBI, research has not yet highlighted the necessary order through which building various skills of mindfulness relates to reductions in stress nor improvement in child behavior problems. Understanding the relationship between practicing specific mindfulness processes, experiencing decreases in parent stress, and subsequently noting decreases in perceptions of child behavior problems may contribute to designing and implementing more optimal MBI with parents to improve mental health across a family.

Indeed, Rayan and Ahmad (2017) and Corti et al. (2018) mentioned that poorly constructed interventions may help explain why current MBI have produced such varied

effect sizes in parental stress and improved parent/child relationships. Parents may have participated in the MBI, but uncertainty exists as to whether they developed specific mindfulness skills related to decreased stress. Renshaw (2020) argues that a critical direction in which the mindfulness literature must head is identifying the behavioral components taught within a mindfulness intervention that specify changes leading to stress reduction. Other researchers such as Bender (in press), Boekhorst (2020), and Thayer (in press) agree, all stating that mindfulness interventions could possibly improve in their effectiveness and predictability after research examines temporal relations of specific internal experiences that occur throughout implementation of an MBI, which are demonstrated to effectively reduce stress by empirical observation.

Purpose of the Current Study

The purpose of the current study was to explore functional relationships of key mindfulness processes found in MBI that are purported to affect parental stress and subsequent perceptions of child problems. Specifically, the current study aimed to explore if a consistent, daily practice of mindfulness caused increases in parents' present-moment awareness or decreases in distraction (one mindfulness process) as well as increases in responding with acceptance or decreasing in avoidance (another mindfulness process). In addition to changes in mindfulness processes, this study aimed to understand if a daily practice of mindfulness likewise caused changes in parents' self-reported happiness or stress (wellbeing outcomes) and decreased their perceptions of child behavior problems.

The following research questions guided this study:

1. Does practicing mindfulness daily have a functional relationship with changing mindfulness processes?
2. Does practicing mindfulness daily have a functional relationship with changing parental stress and wellbeing outcomes?
3. Does practicing mindfulness daily have a functional relationship with changing parental perceptions of their child's behavior problems?

To answer these questions, we utilized a single-case multiple baseline design with four mothers who presented at baseline with high levels of parental stress and elevated perceptions of their child's problem behavior. The mindfulness treatment was a common, standardized, audio-recorded exercise of mindful breathing designed to teach and strengthen mindfulness abilities in adults. Daily and weekly measurements of mindfulness processes, wellbeing, and child behavior problems were collected throughout the study. Given the mindfulness theory of present-moment awareness and responding with acceptance presented by Bishop et al. (2006) and Renshaw (2020), we hypothesized that parents would begin the daily mindful breathing intervention and thereafter experience notable positive changes in both their present-moment awareness and acceptance of experience. Based on theory, we further hypothesized that the daily mindful breathing intervention would also produce positive changes in parents' wellbeing outcomes and perceptions of child behavior problems.

CHAPTER III

METHOD

Recruitment and Participants

School district and University IRB approval for the research project was obtained prior to recruiting participants. Once school district approval occurred, district administrators sent a mass email advertisement to all families across six elementary schools and one middle school that provided a brief description of the study, information about compensation, and a link to a *Qualtrics* survey that caregivers could click on. Interested parents willingly clicked on the survey link and were informed of more details about the study. They were then prompted to answer if they (1) identified as a mother, (2) identified as the primary caregiver of their home, (3) had a child in 3rd to 8th grade. If the caregiver answered “no” to any of these questions, they were informed that they did not meet qualifications to participate in the study, thanked for their time, and provided a list of helpful mental health resources in the community. If the mothers answered yes to all three questions, they were taken to the second section of the survey, which screened for clinical levels of stress and clinical levels of behavior problems in their 3rd- to 8th-grade child. The screener used to measure stress was Cohen et al.’s Perceived Stress Scale and the screener used to measure child problems was Gardner et al.’s (1999) Pediatric Symptoms Checklist-17, which are described in more detail under the Measures section. If participants did not meet clinical levels of stress or child behavior problems, they were informed that they did not meet qualifications to participate in the study, thanked for their time, and provided a list of helpful mental health resources in the community. If the participant met clinical levels of stress and child behavior problems, they were then

provided the consent form and given opportunity to sign the form and provide their email and phone number to the researchers.

After two days, the researchers received signed consent forms from over 100 interested mothers in the community. Each was placed on a waiting list and ranked from highest level stress to lowest level stress. Participants were selected to participate in the study based on the highest level of stress, and the four highest-stressed participants were contacted via email and asked to participate. One of the original participants completed half the intervention but dropped out due to inability to answer the daily measurement battery consistently. She was replaced with another participant from the waiting list. Data for the four mothers who fully participated in the study are presented in the Results section. At the end of the study, all other interested mothers on the waiting list were informed that their participation was no longer, were thanked for their time, and provided a list of free mental health resources in their area.

Participant 1 identified as White and the mother of an 8-year-old boy with problems related to autism and oppositional defiance. Participant 2 identified as White and the mother of an 11-year-old girl with problems related to suicide ideation, inattention, and emotional reactivity. Participant 3 identified as White and the mother of a 9-year boy with problems related to autism, oppositional defiance, and anxiety. Participant 4 identified as Latinx and the mother of an 11-year-old boy with problems related to defiance. The target children for all four participants attended the same school district in northern Utah, and all participants initially presented with high levels of stress and elevated perceptions of their child's behavior problems across internalizing, externalizing, and attention domains (see the Results section).

To increase participants' motivation, mothers were compensated \$50 for each week that they (1) completed daily measures and (2) completed the mindful breathing exercise at least two times per day for 5 to 7 days. All four participants who fully completed this study received full compensation, which amounted to \$50/week for three weeks or \$150 total in cash.

Mindfulness Intervention

The MBI used for this study was an audio-recorded breathing meditation created by the Mindfulness Awareness Research Center UCLA (2017; see https://d1cy5zxxhbcbk.cloudfront.net/guided-meditations/01_Breathing_Meditation.mp3). This standardized meditation invites participants to find a comfortable position to begin meditating in and then prompts the listener to begin noticing the sensations around them while also beginning to pay attention to their breath inside their body. The meditation then guides the listener to develop greater awareness and acceptance of the thoughts and feelings moving in and out of the mind through the process, keeping attention focused on the breath as thoughts and feelings move in and out of the person's awareness. The audio-recording lasts 5 minutes and 31 seconds. Mothers were asked to complete this meditation two times a day for a period of 14 days, and they reported daily measures of their implementation fidelity for the previous day. Basic breathing meditations like this one are a core component of MBI treatment packages used with parents in previous studies (see e.g., Bender, in press). A larger multi-component MBI treatment package—consisting of multiple kinds of mindfulness exercises and extensive psychoeducational sessions—was intentionally avoided in the present study, as we aimed to isolate functional relationship between

mindfulness practices, mindfulness processes, and parent and child outcomes.

Furthermore, previous research shows that isolated and brief mindful breathing exercises like this one are effective for increasing mindfulness, reducing ruminative thinking, and reducing reactivity to stressful situations (Feldman et al., 2010; Feruglio et al., 2021).

Measures

Perceived Stress Scale

The Perceived Stress Scale (PSS; Cohen et al., 1983) was used to screen caregiver stress at the beginning of the study and to assess caregiver stress once a week through baseline and treatment phases for three to four weeks, depending on the length of each participant's baseline period. The PSS has become a standardized and well-accepted measure of general stress in adults, and the tool is used across a variety of studies measuring the effects of different interventions on individual subjective stress levels. This rating form includes 10 questions asking different experiences related to stress, including “In the past month, how often have you been upset because of something that happened unexpectedly” and “In the past month, how often have you felt that you were unable to control important things in your life.” Items are rated on a scale of 0—4 with 0 being *never*, 1 being *almost never*, 2 being *sometimes*, 3 being *fairly often*, and 4 being *very often*. Low levels of stress range from a total score of 0—13, moderate levels of stress range from a total score of 14—25, and high levels of stress range from a total score of 25—40; clinical levels of stress are considered anything in the moderate range or above (Cohen et al., 1983). This measure demonstrates adequate psychometric evidence for validity and reliability (Lee, 2012). The purpose of probing a weekly measure using the

PSS was to compare changes in stress levels captured by this well-validated measure against changes in stress levels using daily single-item ratings mentioned later.

Pediatric Symptom Checklist-17

The Pediatric Symptom Checklist-17 (PSC-17) originally created by Gardner et al. (1999) was used to screen for child behavior problems at the beginning of the study and to assess caregiver ratings of child behavior problems once a week through baseline and treatment phases for three to four weeks, depending on the length of each participant's baseline period. 19 total items are rated on a scale of 0—2 with 0 being never, 1 being *sometimes*, and 2 being *often*. The PSC-17 is commonly used by pediatric healthcare settings as a three-factor, broadband screener for internalizing, externalizing, and attention difficulties in a child. These three factors are added to a final score of total problems across all three factors. The internalizing factor includes five items including “how often does your child feel sad” and “how often does your child feel hopeless.” A score of 5 or higher on internalizing problems is considered clinical (Gardner et al., 1999). The externalizing factor includes seven items including “how often does your child not listen to rules” and “how often does your child blame others for their difficulties.” A score of 7 or higher on externalizing problems is considered clinical (Gardner et al., 1999). The attention factor includes seven items including “how often does your child act as if driven by a motor” and “how often does your child have trouble concentrating.” A score of 7 or higher on attention problems is considered clinical. A total problem score of 15 or higher indicates clinical levels of child problems. The measure is freely distributed across healthcare sites in the United States. Evidence suggests good validity and reliability for this measure (Murphy et al., 2016).

Freiburg Mindfulness Inventory

The Freiburg Mindfulness Inventory (FMI) designed by Walach et al. (2006) was used in this study to probe the mother's mindfulness levels once per week through baseline and treatment phases for three to four weeks, depending on the length of each participant's baseline period. 14 items are rated on a scale of 1—4 with 1 being *Rarely*, 2 being *Occasionally*, 3 being *Fairly Often*, and 4 being *Almost Always*. Items include “I am open to the experience of the present moment” and “I watch my feelings without getting lost in them.” A total score of 14—23 indicates an average item score of 1, which is interpreted as *Rarely Mindful*. A total score of 23—34 indicates an average item score of 2, which is interpreted as *Occasionally Mindful*. A total score of 35—49 indicates an average item score of 3, which is interpreted as *Fairly Often Mindful*. A total score of 50—54 indicates an average item score of 4, which is interpreted as *Almost Always Mindful*. The FMI is a less commonly used measure of mindfulness when compared to other more prominent measures such as Brown and Ryan's (2003) Mindful Attention and Awareness Scale (MAAS) or Baer et al.'s (2006) Five Facet Mindfulness Questionnaire (FFMQ). The MAAS or FFMQ could very well have been used for this study, but the authors chose the less-known FMI given its use of positively worded items, focus on the mindful relationship between an individual and their emotions, and demonstration of strong internal validity. The FMI demonstrates similar psychometric validity and reliability to other prominent measures such as ones mentioned above. As compared to more prominent mindfulness measures, the FMI demonstrated to the researchers the greatest ability to capture mindful perspectives of internal experiences related to wording of the daily ratings of mindfulness mentioned in the next section.

Single-item Ratings of Mindfulness Processes

To capture daily change in participants' mindfulness processes through the implementation of the intervention, a form of measurement necessitated items that were detailed enough to provide an accurate picture of internal change yet feasible to maximize active, daily participation over three to four weeks. Unfortunately, the only valid measures of mindfulness that currently exist require long periods of reflective time to answer in adequate depth and not feasible for answering every day over an extended period. Thus, the authors of this study were faced with a dilemma. How could the daily change of mindfulness and stress experiences be measured in a valid yet feasible format?

Direct behavior ratings (DBR) are a form of daily, brief measurement consistently used by school psychologists to identify specific target behaviors in students that schools hope to increase or decrease, with specific questions created that capture the level of intensity of specific target behaviors (Briesch & Chafouleas, 2016). Recent research demonstrates that such forms of DBR can also be used in self-report format where individuals reflect on their own behavior and rate the frequency to which their specific target behaviors occurred during a given time frame (Briesch & Chafouleas, 2016). Less is known about the efficacy of DBR for internalizing experiences; however, limited research demonstrates that reflecting on brief internalizing experiences such as the rate of anxiety felt in anxiety-provoking situations may be an effective and valid form of measurement during an exposure-based anxiety intervention (Brieich & Chafouleas, 2016). This line of thinking drove the current research study and its intent to use brief self-report ratings to capture internal mindfulness processes as they occurred during the day-to-day experiences of each participant.

There were two mindfulness process variables of interest: present-moment awareness and responding with acceptance (Renshaw, 2020). Each was hypothesized to change in some way over time as the participant practiced the meditation each day. In this study, *present-moment awareness* consisted of a positive measurement for awareness and a complimentary negative measurement for distraction, which might be considered the opposite of awareness. *Mindful acceptance* consisted of a positive measurement for acceptance and a complimentary negative measurement for avoidance.

To measure caregiver mindfulness behaviors in a feasible way, a set of four questions were constructed by the authors of this study. These items were created after reviewing all available caregiver mindfulness rating forms and consolidating items into four specific, all-encompassing ideas. The four items (awareness, distraction, acceptance, and avoidance) are as follows:

- 1.) How often do you intentionally notice your thoughts and feelings?
- 2.) How often are you on autopilot and not actively noticing your thoughts and feelings?
- 3.) How often do you accept and welcome unpleasant thoughts and feelings?
- 4.) How often do you try to ignore, resist, or push away unpleasant thoughts and feelings?

Each question was rated on a scale of 1-10 (1 being *never*, 5 being *half the time*, and 10 being *always*). Caregivers rated their experience with each item every day. Higher scores for noticing and accepting indicate greater levels of awareness and acceptance.

Subsequently, higher scores for distraction and ignoring indicate greater levels of distraction and ignoring. These items measured in tandem with weekly probes from the

FMI provided a valid yet feasible tool for quantifying levels of mindfulness change through duration of the study.

Single-item Ratings of Subjective Wellbeing

Outcome variables in this study were level of parental wellbeing and severity of child problem behaviors identified by the mother. Parent stress was captured with two single-item self-ratings reported by the mother each day in the same fashion as the mindfulness ratings mentioned above. These two self-ratings were created after a thorough review of various measures purporting to measure stress and are reported as follows:

- 1.) How content or happy do you feel today?
- 2.) How dissatisfied or stressed out do you feel today?

Like the mindfulness items above, these items were also rated on a scale of 1-10 (1 being *never*, 5 being *half the time*, and 10 being *always*). Higher scores for happy indicate greater levels of happiness. Subsequently, higher scores for stress indicate greater levels of stress. These items measured in tandem with weekly probes from the PSS provided a valid yet feasible tool for quantifying levels of stress through duration of the study.

Youth Top Problems Assessment

The Youth Top Problems (YTP; Weisz et al., 2011) measure was used to measure daily reports of child behavior problems. YTP is an idiographic assessment of client-desired symptom changes in a specific youth. The initial goal of developing this measure was to create a more efficient assessment of client-desired change over duration of a treatment (Weisz et al.). While most standardized clinical assessments such as the Child Behavior Checklist or Youth Self Report are adequately effective at measuring

standardized symptom change in youth, the YTP adds additional insight into symptom change given its ability to demonstrate unique, client-valued behaviors that cause distress and brought individuals to treatment (Weisz et al.). In other words, the YTP demonstrates behavior changes that a client values as the most important changes they hope to see. Statistical evidence demonstrates strong psychometric validity and reliability; the YTP measure correlates strongly with other measures of child behavior change; data points are reliable over time and responsive to change over course of effective treatment; and the measure proves to be effective, valuable, and useful in various clinical settings (Weisz et al.).

Using the YTP requires a standardized interview with the client prior to beginning the assessment. In a typical interview, the child's caregiver is asked what the three most concerning problems are that they would like to see changed in their child (Weisz et al., 2011). After stating these problems, the caregiver ranks each concern from most concerning to least concerning. After the caregiver's concerns for their child are identified, the caregiver is asked to rank how concerning the problem was each day as part of completing the DBR discussed in the previous section.

During each YTP interview, the following behaviors were as follows: YTP for Participant 1 were identified as (1) "non-compliance," (2) "destroys things," and (3) "excessively reliant on attention." YTP for Participant 2 were identified as (1) "forgetful/spacey," (2) "easily offended," and (3) "sad/withdrawn." YTP for Participant 3 were identified as (1) "aggressive toward siblings," (2) "disrespectful," and (3) "gets scared." YTP for Participant 4 were identified as (1) "argues," (2) "gets in trouble," and (3) "excessive phone time." Each of these items were presented to the mother with the

following qualifier: “Please reflect on your child’s behavior in the last 24 hours. How big of a problem was ...?” Each question was rated on a scale of 1-10 (1 being *not a problem*, 5 being *somewhat of a problem*, and 10 being *very big problem*). Higher scores on YTP indicate greater magnitude of the child’s problems as perceived by the mother.

Social Validity

At the end of the study, participants were administered a brief measure of social validity that assessed their perceptions of improvement, fit, and importance related to the daily mindful breathing practice. Participants were specifically asked these questions:

- 1.) On a scale of 1—5, how much did mindful breathing improve your life?
- 2.) In what ways did mindful breathing improve (or not improve) your life?
- 3.) On a scale of 1—5, how well did mindful breathing fit into your life?
- 4.) What was your experience with fitting mindful breathing into your life?
- 5.) Please reflect on any changes that occurred as a result of mindful breathing. On a scale of 1—5, how important are these changes for you?
- 6.) In what ways are these changes important (or not important) to you?

Research Design and Procedure

After the four mothers completed the *Qualtrics* screener and signed the consent form, they were contacted by the researcher via email to participate in a pre-intervention interview on *Zoom* with the primary researcher of this study. During this meeting, they were reminded of the study plan, they identified their child’s Top Problems for the YTP, and they were given access to the measurement links on *Qualtrics*. The interview began with the researcher introducing themselves and briefly getting to know the mother. The researcher then informed the parent that the study was part of a research project at Utah

State University intending to explore the benefits of a stress-reducing activity on reducing a variety of caregiver issues related to stress. They were informed that their job was to answer the measurement protocols each day, which would be sent in a reoccurring link via daily text message each morning at 9:00 am, and to begin participating in an intervention on a specified day that would occur later. To ensure adequate baseline data, participants were also informed that failure to send in questionnaire results during the baseline phase (the first 4 to 12 days of data collection, depending on where they fell in the study design) would warrant immediate exclusion from the study.

After describing the study details, the researcher conducted the YTP interview to identify child behavior problems that would be assessed. After doing this, the researcher provided an easily accessible link to a Qualtrics survey where they found the six DBR questions related to mindfulness processes and wellbeing outcomes and their personalized YTP rating scales. As a test run, the researcher sent the survey link to the participant's phone via text and the participant answered the questions once with the researcher. They were then reminded again that they would be sent a link to this survey via text message every morning at 9 am, and it was their job to answer the questionnaire each day from then until they were informed to stop, which would last approximately three to four weeks.

After this, the researcher summarized everything presented to the participant; namely, she would begin answering questions on a link sent each day; after a period, she would begin the daily intervention while continuing to answer the questions; and she would continue the intervention and answering the questions every day until instructed to

stop. The interviewer concluded the interview by answering any further questions and thanking the participant for her participation.

This study was conducted using a single-case multiple-baseline design measuring self-reports of caregiver internal experiences and reports of their child's behavior. Participant 1 answered the measurement battery for four days, Participant 2 answered for six days, Participant 3 answered for eight days, and Participant 4 answered for 12 days. After completing each baseline, the mother was contacted again and given a brief introduction to mindful breathing. Specifically, the participant was briefly educated about what mindfulness is and why it is important for parenting. The participant was then read the following script:

Mindfulness is a practice of sustained attention in which we take time to step away from the world, put away distractions, and focus attention on our breath and the sensations of our mind and body. This practice is somewhat like pretending you are a jar full of dirt and water. As you go through your day, your jar begins to get shaken up and the dirt begins to swirl around in the water, making the water become murky and difficult to see through. Mindfulness is the act of stepping back, removing distraction, and centering yourself on your breath, like setting the jar down and allowing the dirt to settle. This allows you to see clearly again.

Practicing mindfulness is somewhat like pretending you are a mountain noticing the various clouds, clear skies, and dark storms surrounding your peak. You yourself are not the weather. You are the mountain. The practice of mindfulness is to look at the various clouds surrounding your mountain from a

perspective of distance rather than be swirled around in the stories that your storms are telling you. You might notice a thought and say, “that’s a stormy thought” and then put your attention back on your breath.

The point of mindfulness is not to simply sit and forcefully quiet the mind but to pay attention to the breath and notice the content of thoughts or feelings with an attitude of nonjudgmental acceptance as they arise in your head. As we practice mindfulness, we allow whatever is occurring in our head to rise without attempting to resist or change the experience. Mindfulness is somewhat like receiving gifts on your birthday or another holiday in which gifts are exchanged. Sometimes you like the gifts you receive and sometimes you don’t like them; regardless, you receive all the gifts. The practice of mindfulness is the practice of learning to receive whatever gifts your mind and body want to give you, whether you like them or not.

The participant was then allowed to ask questions and receive clarification where needed.

After being taught what mindfulness is, they were introduced to the meditation recording. The researcher provided an easily accessible link of the recording to the participant, and the participant and interviewer listened to the recording all the way through together one time. The interviewer then asked the participant if they had questions about the exercise. The participant was instructed that they were to listen to this recording twice a day every day for the next 14 days; specifically, they should listen to it once at the beginning of the day and once at the end. The participant was reminded to practice the meditation recording twice a day while continuing to complete the daily measurements the same way as before for 14 more days. After starting the treatment

phase, the daily measurement also included a treatment fidelity question asking the participant (1) if they did the morning recording (answering “yes” or “no”) and (2) if they did the evening recording (answering “yes” or “no”). The study ended for each participant after they completed the baseline period of answering the measurement battery for their designated period and then doing mindful breathing every day twice a day for 14 days while continuing to complete the measurement battery.

Through the process of daily measurement, participants were also sent an additional *Qualtrics* form once per week that included the validated Perceived Stress Scale, Freiburg Mindfulness Inventory, and Pediatric Symptoms Checklist-17.

After 14 days of intervention, each participant was instructed that the study was over, and they no longer needed to answer survey results nor participate in the meditation. They were then given the brief measure of social validity in which they were asked to describe in writing the various experiences they had while engaging in the intervention. After providing social validity responses regarding the intervention, participants scheduled a time where they met with the primary researcher at the university. At this brief in-person meeting, they were compensated \$150 in cash in a sealed envelope, thanked for their time, and provided a list of mental health resources they could access to receive further help for their child’s struggles. The cash was provided and sponsored by the Utah State University Psychology Department’s funding for thesis and dissertation projects.

Data Analysis

Scores from the daily measurement battery were coded into single-case line graphs representing each variable. Scores from the weekly validity probes were added

and coded into tables. Altogether, each participant's data were presented in multiple graphs and tables to evaluate any changes in dependent variables over the course of the study.

Prior to examining functional relationships, single-case effect sizes were calculated to examine the effectiveness of mindful breathing on changing each behavioral process over time. Improvement rate difference (IRD) and nonoverlap of all pairs (NAP) effect sizes were calculated for each measure of behavior using Pustejovsky et al.'s (2021) single-case effect size calculator. IRD calculates differences in improvement rates between treatment phase and baseline phase (Parker et al., 2011). NAP calculates the probability of a random score from the treatment phase exceeding the level of a random score from the baseline phase (Parker & Vannest, 2009). Using the two together provided a more reliable measure of single-case effect size than one alone. Means and standard deviations of baseline data and treatment data were also calculated for each measured variable and presented in a table.

After calculating effect sizes and creating graphs, visual analysis was employed to evaluate and interpret relationships observed in the data. Specifically, potential changes in variability, level, and trend were evaluated for all mindfulness processes, wellbeing, and YTP variables. Visual analyses were assisted through calculating two mean trend lines for each measure of behavior with one representing the level during baseline phase and the other representing the level during treatment phase. Data points were examined in comparison to these mean lines.

Variabilities, levels, and trends of each baseline phase was compared to each subsequent treatment phase within each variable. Additionally, the variability, level, and

trend of each measure was compared against the other variabilities, levels, and trends between other variables. Comparing independent changes in each rating during baseline to treatment, as well as cross-variable examination, offered information regarding the presence or absence of functional relationships posed in the research questions.

CHAPTER IV

RESULTS

Figures 1–8 present visual displays of participants’ daily ratings of awareness, distraction, acceptance, ignoring, happiness, stress, total child problems, and average child problems, respectively. Table 1 presents intervention effect sizes for each dependent variable across participants. Table 2 presents means and standard deviations of dependent variables across participants and phases. Tables 3–8 present weekly probe scores for the FMI, PSS, PSC-17 Internalizing (PSC-I), PSC-17 Attention (PSC-A), PSC-17 Externalizing (PSC-E), and PSC-17 Total Problems (PSC-Total), respectively. Results for each participant are describe below.

Participant 1***Implementation Fidelity***

Participant 1 reported that she completed 100% of the intervention. She practiced the morning and evening recordings every day for all 14 days.

Mindfulness Processes

Baseline data for *awareness* were moderately variable and averaged at a moderate level with an upward trend (see Figure 1). Upon entering the treatment phase, a steady increase to a high level was observed with similar variability over time. NAP and IRD for awareness indicated large effect sizes in the desired direction. Baseline data for *distraction* were minimally variable and averaged at a high level. Upon entering the treatment phase, a steady decrease to a moderate level was observed with similar variability over time. NAP and IRD for distraction indicated large effect sizes in the desired direction.

Baseline data for *acceptance* were minimally to moderately variable and averaged at a moderate level with an upward trend. Upon entering the treatment phase, a steady increase to moderately high level was observed with moderate variability over time. NAP and IRD for acceptance indicated large effect sizes in the desired direction.

Baseline data for *ignoring* were minimally variable and averaged at a high level with a slightly decreasing trend. Upon entering the treatment phase, a steady decrease to moderately low level was observed with minimal to moderate variability over time. NAP and IRD for ignoring indicated large effect sizes in the desired direction. Based on these observations, increased daily mindfulness demonstrated a functional relationship with increased levels of both awareness and acceptance, and decreased levels of ignoring.

Wellbeing Outcomes

Baseline data for *happiness* were minimally to moderately variable and averaged at a moderately low level with a slightly decreasing trend. Upon entering the treatment phase, a sudden change to moderately high level with continued steady increase to high levels was observed with minimal variability over time. NAP and IRD for happiness indicated large effect sizes in the desired direction.

Baseline data for *stress* were minimally variable and averaged at a high level with a stable trend. Upon entering the treatment phase, a sudden change to moderate level with stabilization at moderate levels was observed over time. NAP and IRD for stress indicated large effect sizes in the desired direction. Based on these observations, increased daily mindfulness demonstrated a functional relationship with decreased stress and increased happiness.

Child Problem Outcomes

Baseline data for Top Problem 1, “non-compliance”, were highly variable and averaged at a moderately high level with a slightly decreasing trend. Upon entering the treatment phase, a slight increase to high level was observed with moderate variability over time. NAP and IRD for Top Problem 1 indicated negligible effects in the desired direction. A post-hoc analysis of effect size in the undesired direction indicated mixed results, with IRD indicating a moderate effect (IRD = 0.52) and NAP indicating a negligible effect (NAP = 0.62). Baseline data for Top Problem 2, “destroys things”, were highly variable and averaged at a moderate level with a slightly decreasing trend. Upon entering the treatment phase, a slightly upward trend at moderate level was observed with moderate variability over time. NAP and IRD for Top Problem 2 indicated no effects in the desired direction. A post-hoc analysis of effect size indicated moderate effects in the undesired direction (IRD = 0.68; NAP = 0.67). Baseline data for Top Problem 3, “excessively reliant on attention”, were highly variable and averaged at a high level with a slightly decreasing trend. Upon entering the treatment phase, a similar trend at high level was observed with low variability over time. NAP and IRD for Top Problem 3 indicated no effects in the desired direction. A post-hoc analysis of effect size in the undesired direction indicated mixed results, with IRD indicating a moderate effect (IRD = 0.52) and NAP indicating a negligible effect (NAP = 0.54).

An average of all three Top Problems was calculated and graphed as a multiple baseline display of overall caregiver-rated child problem severity. Baseline data were moderately variable and averaged at a moderate to high level with a decreasing trend. Upon entering the treatment phase, the data rose to high level with minimal to moderate

variability. NAP and IRD for average problem behavior indicated negligible effects in the desired direction. A post-hoc analysis of IRD indicated a moderate effect in the undesired direction (IRD = 0.52) and NAP indicated a negligible effect in the undesired direction (NAP = 0.58). Based on these observations, increased daily mindfulness did not demonstrate a functional relationship with decreased perceptions of child behavior problems. Rather, mindfulness may have caused increased mother perceptions of child behavior problems.

Supplemental Weekly Probes

Throughout the study, four FMI probes increased over time and shifted from an average-item score interpretation of *Occasionally Mindful* to *Fairly Often Mindful*. Four PSS probes decreased over time and shifted from a clinical interpretation of *High Stress* to *Moderate Stress* (see Table 3). Four PSC-I probes decreased over time and, while the data remained in the *Clinical* range, internalizing problems decreased to just one point above the *Non-Clinical* range (see Table 5). Four PSC-A probes did not shift over time and remained in the *Clinical* range (see Table 6). Four PSC-E probes varied significantly with shifts between interpretations of *Clinical* and *Non-Clinical* (see Table 7). Four PSC-Total probes decreased slightly over time but remained in the *Clinical* range through duration of the study (see Table 8). Based on these observations, increased daily mindfulness practice demonstrated a functional relationship with increased mindfulness, decreased stress, and decreased child internalizing problems but no relationship with child attention problems nor child externalizing problems.

Social Validity

Regarding *improvement*, Participant 1 rated that mindful breathing improved her life *A Great Deal* (rating = 5/5). She stated, “It helped me remember to breathe, take a moment to think things through, not just react to what's happening, and that I can handle myself, even if I can't control the things around me.” Regarding *fit*, Participant 1 rated that mindful breathing fit in her life *Very Well* (rating = 4/5). She stated, “It took a few days for me to remember to do it when in the moment, but I could tell a huge difference when I did.” Regarding *importance*, Participant 1 rated that mindful breathing was *Extremely Important* for her life (rating = 5/5). She stated, “I am more mindful of myself and my actions. I pay more attention to how I respond to things instead of jumping the gun and going straight to yelling.” Based on these ratings, daily mindfulness practice was effective, appropriate, and important for Participant 1.

Participant 2

Implementation Fidelity

Participant 2 reported that she completed 96% of the intervention. She practiced the morning recording every day but missed one evening recording.

Mindfulness Processes

Baseline data for *awareness* were initially moderately variable but stabilized to minimal variability over time and averaged at a moderate level with a slightly decreasing trend (see Figure 1). Upon entering the treatment phase, a slight increase to moderately high level was observed with similar variability. IRD for awareness indicated a large effect size in the desired direction, and NAP indicated a moderate effect.

Baseline data for *distraction* were initially moderately variable but stabilized to minimally variable over time and averaged at a moderately high level with an increasing trend (see Figure 2). Upon entering the treatment phase, a steady decrease to moderately low level was observed with similar variability over time. IRD for awareness indicated a large effect size in the desired direction, and NAP indicated a moderate effect.

Baseline data for *acceptance* were minimally variable and averaged at a moderate level with a stable trend (see Figure 3). Upon entering the treatment phase, data became moderately to highly variable, but no notable change in average level occurred. NAP and IRD for acceptance indicated negligible effect sizes in the desired direction.

Baseline data for *ignoring* were moderately variable and averaged at a moderate level with a slightly decreasing trend (see Figure 4). Upon entering the treatment phase, a slight decrease and then steady increase in level was observed with minimal to moderate variability over time with an increasing trend. NAP and IRD for ignoring indicated negligible effect sizes in the desired direction. Based on these observations, increased daily mindfulness demonstrated a functional relationship with increased awareness, but a relationship with acceptance was not demonstrated.

Wellbeing Outcomes

Baseline data for *happiness* were minimally to moderately variable and averaged at a moderately low level with a slightly decreasing trend (see Figure 5). Upon entering the treatment phase, the data became highly variable and averaged at a moderate level with a slightly increasing trend. IRD for happiness indicated a negligible effect size in the desired direction, but NAP indicated a moderate effect.

Baseline data for *stress* were minimally to moderately variable and averaged at a high level with a slightly increasing trend (see Figure 6). Upon entering the treatment phase, the data became moderately to highly variable and averaged at a moderate level with a slightly decreasing trend. IRD for stress indicated a negligible effect size in the desired direction, but NAP indicated a moderate effect. Based on these observations, increased daily mindfulness demonstrated a functional relationship with both increased happiness and decreased stress.

Child Problem Outcomes

Baseline data for Top Problem 1, “forgetful/spacey”, were minimally variable and averaged at a high level with a slightly decreasing trend (see Figure 7). Upon entering the treatment phase, an immediate decrease to a moderate level with moderate variability was observed over time. NAP and IRD for Top Problem 1 indicated moderate effects in the desired direction.

Baseline data for Top Problem 2, “easily offended”, were moderately variable and averaged at a moderate level and a decreasing trend (see Figure 7). Upon entering the treatment phase, a slight decrease to a moderate level with high variability was observed over time. NAP and IRD for Top Problem 2 indicated moderate effects in the desired direction.

Baseline data for Top Problem 3, “sad/withdrawn”, were low to moderately variable and averaged at a moderate level and a decreasing trend (see Figure 7). Upon entering the treatment phase, a slight trend to low level with moderate to high variability was observed over time. NAP and IRD for Top Problem 3 indicated moderate effects in the desired direction.

An average of all three Top Problems was calculated and graphed as a multiple baseline display of overall caregiver-rated child problem severity. Baseline data had minimal to moderately variable and averaged at a moderate to high level with a decreasing trend (see Figure 8). Upon entering the treatment phase, the data decreased to moderately low level with minimal to moderate variability and a decreasing trend. NAP and IRD for average problem behavior indicated moderate effects in the desired direction. Based on these ratings, daily mindfulness practice was effective, appropriate, and important for Participant 2.

Supplemental Weekly Probes

Throughout the study, four FMI probes varied slightly but increased over time from an average-item score interpretation of *Occasionally Mindful* to *Fairly Often Mindful* (see Table 3). Four PSS probes decreased over time and shifted from an interpretation of *High Stress* to *Moderate Stress* (see Table 4). Four PSC-I probes decreased over time and, while the data remained in the *Clinical* range, internalizing problems decreased to just one point above the *Non-Clinical* range (see Table 5). Four PSC-A probes did not shift over time and remained in the *Clinical* range (see Table 6). Four PSC-E probes decreased slightly over time all within the *Non-Clinical* range (see Table 7). Four PSC-Total probes decreased over time all within the *Non-Clinical* range (see Table 8). Based on these observations, increased daily mindfulness practice demonstrates a functional relationship with increased mindfulness, decreased stress, and decreased child internalizing problems but no relationship with child attention problems nor child externalizing problems.

Social Validity

Regarding *improvement*, Participant 2 rated that mindful breathing improved her life *A Moderate Amount* (rating = 3/5). She stated, “It made me take the time to center myself. If I was having a bad day or a stressful moment it helped to bring myself back to a more open and peaceful state.” Regarding *fit*, Participant 2 rated that mindful breathing fit in her life *Extremely Well* (rating = 5/5). She stated, “It’s such a simple thing to do and easy to find time to do it. Even I was sitting at my desk working. I could close my eyes and listen to the recording.” Regarding *importance*, Participant 2 rated that mindful breathing was *Very Important* for their life (rating = 4/5). She stated, “Mindfulness really does help you engage with others in your life without making snap decisions or lashing out. It helps to control your overall mood. I believe that is helpful, especially when you are a mom, and all the kids are screaming at the same time.” Based on these descriptions, daily mindfulness practice appears related to increases in socially desired stress and parenting outcomes.

Participant 3

Implementation Fidelity

Participant 3 reported that she completed 89% of the intervention. She missed two morning recordings and one evening recording.

Mindfulness Processes

Baseline data for *awareness* were moderately variable and averaged at a moderate level and a slightly upward trend (see Figure 1). Upon entering the treatment phase, a sudden change to high level was observed with minimal variability, and over time the data decreased to a moderately high level with minimal variability. IRD for awareness

indicated a small effect size in the desired direction, and NAP indicated a moderate effect.

Baseline data for *distraction* were moderately variable but stabilized to minimally variable over time and averaged at a moderate level and a slightly upward trend (see Figure 2). Upon entering the treatment phase, a sudden change to low level was observed with minimal variability, and over time the data increased from low to moderate levels with minimal variability. IRD for distraction indicated a large effect size in the desired direction, and NAP indicated a moderate effect.

Baseline data for *acceptance* were moderately variable and averaged at a moderate level and a level trend (see Figure 3). Upon entering the treatment phase, a sudden change to high level occurred with similar variability, and over time the data decreased steadily to a low level with minimal variability. No notable change in average level occurred from baseline to treatment phases. NAP and IRD for acceptance indicated negligible effect sizes in the desired direction.

Baseline data for *ignoring* were moderately variable and averaged at a moderate level and an upward trend (see Figure 4). Upon entering the treatment phase, a sudden change to low level and then steady increase to high level was observed, followed by stabilization back to moderate level with minimal to moderate variability. NAP and IRD for ignoring indicated negligible effect sizes in the desired direction. Based on these observations, increased daily mindfulness demonstrated a functional relationship with increased awareness and decreased distraction, but a relationship with acceptance and ignoring was unpredictable and uncertain.

Wellbeing Outcomes

Baseline data for *happiness* were minimally to moderately variable and averaged at a moderate level and a slightly upward trend (see Figure 5). Upon entering the treatment phase, a sudden drop to low levels occurred for two days, and then data rose back to moderate levels. A slight increase then occurred over time with minimal variability. NAP and IRD for happiness indicated moderate effect sizes in the desired direction.

Baseline data for *stress* were moderately variable and averaged at a moderate to high level with a slightly downward trend (see Figure 6). Upon entering the treatment phase, a sudden rise to high levels occurred for three days, and then data dropped back to moderate levels. A slight decrease then occurred over time with minimal variability. NAP and IRD for stress indicated moderate effect sizes in the desired direction. Based on these observations, increased daily mindfulness demonstrated a functional relationship with both increased happiness and decreased stress.

Child Problem Outcomes

Baseline data for Top Problem 1, “aggressive toward siblings”, were highly variable and averaged at a low to moderate level with a downward trend (see Figure 7). Upon entering the treatment phase, data remained at a low to moderate level but decreased to moderately low variability. NAP and IRD for Top Problem 1 indicated negligible effects in the desired direction.

Baseline data for Top Problem 2, “disrespectful”, were moderately variable and averaged at a moderate level with a downward trend (see Figure 7). Upon entering the treatment phase, data remained at a moderate level with moderate variability. IRD for

Top Problem 2 indicated a negligible effect size in the desired direction, but NAP indicated a moderate effect.

Baseline data for Top Problem 3, “gets scared”, were highly variable and averaged at a moderate level with a downward trend (see Figure 7). Upon entering the treatment phase, data decreased to low level with low variability observed over time. IRD for Top Problem 3 indicated a negligible effect size in the desired direction, but NAP indicated a moderate effect.

An average of all three Top Problems was calculated and graphed as a multiple baseline display of overall caregiver-rated child problem severity. Baseline data were highly variable and averaged at a moderate level with a downward trend (see Figure 8). Upon entering the treatment phase, the data decreased to a moderately low level with minimal to moderate variability. IRD for average problem behavior indicated a negligible effect in the desired direction, but NAP indicated a moderate effect. Based on these observations, increased daily mindfulness possibly demonstrates a functional relationship with some decreased mother perceptions of child behavior problems, but concrete interpretations are ultimately uncertain.

Supplemental Weekly Probes

Throughout the study, four FMI probes increased over time from an average-item score interpretation of *Rarely Mindful* to *Occasionally Mindful* (see Table 3). Four PSS probes decreased over time and shifted from an interpretation of *High Stress* to *Moderate Stress* (see Table 4). Four PSC-I probes decreased over time and shifted from an interpretation of *Clinical* to *Non-Clinical* and then back to *Clinical* on the last data point (see Table 5). While the data increased back to the *Clinical* range, the internalizing

problems score sat at just one point above the *Non-Clinical* range. Four PSC-A probes did not shift over time and remained in the *Clinical* range (see Table 6). Four PSC-E probes decreased slightly over time all remaining in the *Clinical* range (see Table 7). Four PSC-Total probes decreased over time all remaining in the *Clinical* range (see Table 8). Based on these observations, increased daily mindfulness practice demonstrates a functional relationship with increased mindfulness, decreased stress, and decreased child internalizing problems but no relationship with child attention problems nor child externalizing problems.

Social Validity

Regarding *improvement*, Participant 3 rated that mindful breathing improved their life *A Lot* (rating = 4/5). She stated, “I was able to clear my head easier in a lot of stressful situations. I could focus on my breathing more and center myself.” Regarding *fit*, Participant 3 rated that mindful breathing fit in their life *Very Well* (rating = 4/5). She stated, “I was able to wake up less stressed and anxious. It helped start the day off with positive thoughts.” Regarding *importance*, Participant 3 rated that mindful breathing was *Very Important* for their life (rating = 4/5). She stated, “In the mornings I would usually hate being awake and just grumpy and groggy for a while. Mindful breathing really helped clear my head and start the day off better, which in turn made the rest of the day better.” Based on these ratings, daily mindfulness practice was effective, appropriate, and important for Participant 3.

Participant 4

Implementation Fidelity

Participant 4 reported that she completed 93% of the intervention. She practiced every morning recording but missed two evening recordings.

Mindfulness Processes

Baseline data for *awareness* were moderately variable and then stabilized to low variable, averaging at a low to moderate level with a stable trend (see Figure 1). Upon entering the treatment phase, an increase to moderate level was observed with low variability. NAP and IRD for awareness indicated moderate effect sizes in the desired direction.

Baseline data for *distraction* were moderately variable and averaged at a moderately high level with a slightly increasing trend (see Figure 2). Upon entering the treatment phase, a sudden decrease to moderate level was observed with a steady continual decrease to low level over time and low variability. IRD for distraction indicated a large effect size in the desired direction, and NAP indicated a moderate effect.

Baseline data for *acceptance* were minimally to moderately variable and averaged at a moderately low level with a decreasing trend (see Figure 3). Upon entering the treatment phase, a sudden increase to moderate level was observed with minimal variability over time. NAP and IRD for acceptance indicated moderate effect sizes in the desired direction.

Baseline data for *ignoring* were moderate to highly variable and averaged at a moderate level with a slightly downward trend (see Figure 4). Upon entering the treatment phase, a decrease to low level was observed with minimal variability over time.

IRD for ignoring indicated a large effect size in the desired direction, and NAP indicated a moderate effect. Based on these observations, increased daily mindfulness demonstrated a functional relationship with increased levels of both awareness and acceptance as well as decreased levels of both distraction and ignoring.

Wellbeing Outcomes

Baseline data for *happiness* were highly variable and averaged at a moderate to high level with an upward trend (see Figure 5). Upon entering the treatment phase, a change to high level with minimal to moderate variability occurred over time. IRD for happiness indicated a negligible effect size in the desired direction, but NAP indicated a moderate effect.

Baseline data for *stress* were moderate to highly variable and averaged at a moderate level with a stable trend (see Figure 6). Upon entering the treatment phase, a change to moderately low level with moderate variability over time. IRD for stress indicated a negligible effect size in the desired direction, but NAP indicated a moderate effect. Based on these observations, increased daily mindfulness demonstrated a functional relationship with both increased happiness and decreased stress.

Child Problem Outcomes

Baseline data for Top Problem 1, “argues”, were moderately variable and averaged at a high level with a stable trend (see Figure 7). Upon entering the treatment phase, data decreased to moderately high level with moderate variability. NAP and IRD for Top Problem 1 indicated negligible effects in the desired direction. Baseline data for Top Problem 2, “gets in trouble”, were minimally variable and averaged at a low level with a slightly upward trend (see Figure 7). Upon entering the treatment phase, data

increased to moderately low level with moderate variability. NAP and IRD for Top Problem 2 indicated negligible effects in the desired direction. A post-hoc analysis of effect size in the undesired direction indicated mixed results, with IRD indicating a negligible effect (IRD = 0.38) and NAP indicating a moderate effect (NAP = 0.72). Baseline data for Top Problem 3, “excessive phone time”, were minimally variable and averaged at a high level (see Figure 7). Upon entering the treatment phase, data continued at high level with low variability but decreased to moderate level over time. NAP and IRD for Top Problem 3 indicated negligible effects in the desired direction.

An average of all three Top Problems was calculated and graphed as a multiple baseline display of overall caregiver-rated child problem severity. Baseline data were minimal to moderately variable and averaged at a moderate level with a slightly upward trend (see Figure 8). Upon entering the treatment phase, the data remained at moderate level with minimal variability. NAP and IRD for average problem behavior indicated negligible effects in the desired direction. Based on these observations, increased daily mindfulness did not demonstrate a functional relationship with decreased perceptions of child behavior problems.

Supplemental Weekly Probes

Throughout the study, five FMI probes increased over time from an average-item score interpretation of *Fairly Often Mindful* to *Almost Always Mindful* (see Table 3). Five PSS probes decreased over time and shifted from an interpretation of *Moderate Stress* to *Low Stress* (see Table 4). Five PSC-I probes decreased over time and shifted from an interpretation of *Clinical* to *Non-Clinical* (see Table 5). PSC-A, PSC-E, and PSC-Total probes remained in the *Non-Clinical* range except for the second probe, which for all

three variables raised to the *Clinical* range then dropped back to *Non-Clinical* and remained for duration of the study (see Tables 6-8). Based on these observations, increased daily mindfulness practice demonstrated a functional relationship with increased mindfulness, decreased stress, and decreased child internalizing problems, but no relationship with child attention problems, child externalizing problems, or child total problems.

Social Validity

Regarding *improvement*, Participant 4 rated that mindful breathing improved their life *A Moderate Amount* (rating = 3/5). She stated, “I can feel relaxed even when I’m stressed out, I hear the words of the recording.” Regarding *fit*, Participant 4 rated that mindful breathing fit in their life *Very Well* (rating = 4/5). She stated, “My life is always on the go, so taking the time to relax for a minute is a huge help.” Regarding *importance*, Participant 4 rated that mindful breathing was *Extremely Important* for their life (rating = 5/5). She stated, “It is important for daily life.” Based on these ratings, daily mindfulness practice was effective, appropriate, and important for Participant 4.

CHAPTER V

DISCUSSION

Research demonstrates that greater parental involvement with youth is associated with desired outcomes in students including decreased mental health problems, increased academic ability, and increased peer relationships (El Nokali et al., 2010; Fan & Chen, 2001; Wang et al., 2019). Stress is a significant experience impeding a parent's present-moment involvement with their child (Lucas-Thompson et al., 2020). Increased parental stress moderates a variety of behavior problems in students, including increased emotional dysregulation, internalizing problems, externalizing problems, and even symptoms of autism (Chan & Neece, 2018; Lucas-Thompson et al., 2020; Shalev et al., 2020). Decreasing parental stress reduces symptoms of youth struggles and increases wellbeing in parents and their children (Daundasekara et al., 2021; McGregor et al., 2020; Moreland & Apker, 2016; Ward & Lee, 2020).

Mindfulness is intentional present-moment awareness and responding to awareness with an attitude of non-judgmental acceptance (Bishop et al., 2004; Renshaw, 2020). MBI have been shown to be mild to moderately effective at increasing mindfulness ability and decreasing stress in caregivers (e.g., Alexander, 2018; Rayan & Ahmad, 2017; Townshend et al., 2016). Increased mindfulness in caregivers is associated with decreased behavior problems in their children (e.g., McGregor et al., 2020; Townshend et al., 2016). However, critical issues exist including varied effect sizes, poorly constructed MBI, unstandardized protocols, and measurement disagreement (Goodman et al., 2017; Rayan & Ahmad, 2017; Renshaw, 2020).

More research is necessary before recommending MBI to caregivers as means to effectively, indirectly decreasing behavior problems in youth. Moreover, research is needed to clarify the processes underlying the effects of MBI on caregiver stress. To design intentional and effective interventions, research necessitates a closer focus on functional relationships and their association with increases in desired outcomes (Nock, 2007). The purpose of this study was to explore pathways through which mindful breathing with mothers might lead to greater mindfulness behaviors, decreased stress, and decreased ratings of child behavior problem severity.

This study examined effects of mindful breathing via a multiple-baseline, single-case method. Daily self-reports of mindfulness processes, wellbeing, and observed child behavior problems were reported by mothers. Baseline data were observed for a brief period prior to implementing the mindful breathing intervention. Upon entering the treatment phase, mothers were introduced to basic mindfulness principles and practiced a 5-minute mindful breathing recording twice a day for 14 days. The same self-reports of mindfulness processes, wellbeing, and child behavior problems continued throughout. These daily measurements were supplemented once per week with probes of more robust rating scales of mindfulness, stress, and child behavior problems. Mothers reported a range of implementation fidelity from 89%—100%. Change processes in weekly probes were compared against change processes in daily ratings to validate the measurement process. Visual analysis and single-case effect sizes evaluated functional relationships between daily mindfulness practice and changes in mindfulness processes, wellbeing outcomes, and perceptions of child behavior outcomes. Mothers also provided quantitative and qualitative descriptors of social validity at the end of the study.

Mindfulness Processes and Stress and Wellbeing Outcomes

Results demonstrate that mindful breathing decreased mothers' distraction and increased awareness (see Figures 1–2); simultaneously, increased happiness and decreased stress occurred (see Figures 5–6). While effect sizes and trend levels varied (see Tables 1–2), most notable changes occurred in all participants across the dual-measured awareness and stress variables. Over the baseline period and 14 consistent days of practice, weekly probes from the FMI and PSS demonstrated that mindful breathing increased mindfulness ability and decreased stress across all participants (see Table 3). As caregivers consistently practiced the twice daily 5-minute breathing intervention, mindfulness increased from one average-item level at the beginning of the study (e.g., “Rarely Mindful”) to one increased average-item level across all mothers by the end of the study (e.g., “Occasionally Mindful”). Similarly, stress scores on the PSS decreased by one rating level across all mothers by the end of the study. For example, a caregiver would report “High Stress” at the beginning of the study and “Moderate Stress” by the end of the study (see Table 4). Further results from qualitative social validity responses indicate that mindful breathing effectively increased mindfulness ability and decreased stress across all four participants. Quantitative data suggests that this occurred over time as participant awareness increased and distraction decreased. These changes align with the results of many previous studies in which practicing mindfulness was related to experiencing changes in both mindfulness level and stress (i.e., Alexander (2018); Cachia et al. (2016); Frantz et al. (2018); Taylor et al. (2016); Townshend et al., 2016)

Changes also occurred in acceptance and ignoring variables; however, the functional nature between mindful breathing, acceptance, stress, and perceptions of child

behavior problems were inconsistent and inconclusive (see Figures 3–4). After beginning mindful breathing, Participant 1 and 4 reported predictable trends in the acceptance and ignoring variables, but Participant 2 and 3 reported erratic variability and confusing trends (see Figures 3–4). This may have occurred for one of two reasons: (1) A measurement error could have occurred in that Participants 1 and 4 conceptualized the desired definition of acceptance and ignoring, but Participants 2 and 3 conceptualized an alternate definition of the constructs. (2) Mindful breathing was not as effective at teaching true acceptance as it was with teaching awareness. Mindful breathing led to a change in acceptance and ignoring, but the erratic nature of the data fails to provide any conclusive explanation of the mothers' experiences. Past research demonstrates that acceptance may be the best predictor of decreased stress, psychopathology, and wellbeing (Kotsou et al., 2018). Given this research and current findings, future work behooves investigating the validity and treatment utility of assessment in this domain (Hayes et al., 1987).

Perceptions of Child Behavior Problems

Results from mothers' reports of child problems demonstrate mixed and interesting findings. Notably, Participant 2 and 3 reported moderate to large decreases in some child problems, Participant 4 reported negligible decreases in child problems, and Participant 1 reported significant, negative increases in child problems (see Figures 7–8). The broad and exploratory nature through which child behavior problems was examined prevents the current study from making clinically relevant judgements; however, amidst these mixed findings exists interesting patterns necessary for future research to closely investigate. These findings include reflective monitoring as an unexpected, potential

cause of reducing child behavior problems, increased mindfulness in Participant 1 causing an undesired increase in child behavior problems, and mindful breathing decreasing child internalizing problems more effectively than decreasing attention or externalizing problems. Each of these observations are explored below.

Reflective Daily Ratings May Decrease Problems

The study authors noticed an interesting, repeated trend in the daily Top Problems ratings: in three of the four participants, baseline data trended downwards before any sort of treatment was presented. Problems began decreasing in trend as soon as participants began reporting their child's daily behaviors (see Figures 7–8). This may have been for one of two reasons: (1) Daily reflecting on and recording child behavior problems could have become an intervention in and of itself for changing the mother's perspective of their child's problems, or (2) increasing awareness of daily behaviors via daily reflection of behaviors encouraged the mother to be more thoughtful in their responses to problems over time.

Literature on self-monitoring supports the observed phenomenon of daily reflection of behaviors effectively causing increases in desired behaviors. For example, weight loss literature demonstrates that self-monitoring of calorie intake is associated with significant weight loss over time (Burke et al., 2011). Related to caregiving, teachers who self-monitored procedural integrity for enacting behavioral interventions saw more effective change in youth academic readiness compared to teachers who did not self-monitor procedural integrity (Plavnick et al., 2013). The downward trend observed across most baseline data may suggest that reflective assessment of child problems could have acted as an unintentional intervention confounding the intervention of mindful breathing.

It is difficult to determine where caregiver mindful breathing caused a decrease in child behavior severity and where caregivers daily monitoring behaviors caused a decrease in child behavior severity. Whether related to mindful breathing or reflective daily monitoring, the related behavior of increasing awareness evidently is related to some decreases in problematic behaviors across some caregivers.

Undesired Increase in Behavior Problems

Another interesting finding from the child behavior ratings came from Participant 1, who not only reported negligible effects for decreasing their child's behavior problems but moderate effects heading in the undesired direction (see Figures 7-9). Participant 1, who's child was reported with having clinical diagnoses of autism spectrum disorder and oppositional defiant disorder, identified her child's top problems as "compliance," "destroys things," and "reliant on attention." All potentially externalizing in nature, these problems increased in severity as Participant 1 engaged in mindful breathing over time. Interestingly, Participant 1 reported the strongest positive effects across all mindfulness and wellbeing processes as she continued engaging in the intervention, yet as Participant 1 became more attentive, more accepting, and less stressed, her child was reported to engage in a greater severity of externalizing problems.

This experience may have occurred for a variety of reasons. Past research demonstrates that oppositional defiance is usually facilitated by a cycle of reactivity in both the parent and child (Fraire & Ollendick, 2013; Kolko et al., 2008). It may be that mindful breathing caused Participant 1 to become less reactive to their child's externalizing behaviors at home, which elicited greater reactivity from the child in attempting to reinforce old patterns of mother reactivity. The phenomenon described as

“extinction burst” in Lerman and Iwata (1995) may be one way of conceptualizing why Participant 1’s mindfulness and wellbeing processes increased yet child problem ratings also increased. From a different perspective, it may also be that Participant 1’s increase in awareness caused greater attention to the true frequency of her child’s problems. Ultimately, it is inconclusive in the present data if the child’s behavior changed or if simply the mother’s perception of the child’s behavior changed.

Internalizing Problems

A final interesting pattern noticed from the child behavior problems is the greater effect that caregiver mindful breathing had on indirectly reducing child internalizing problems more than attention or externalizing problems. The data from Participants 2 and 3 and supplemental validation from weekly probes highlight this pattern. Participant 2 rated their child’s problems as “forgetful/spacey,” “easily offended,” and “sad/withdrawn,” and Participant 3 rated their child’s problems as “aggressive toward siblings,” “disrespect,” and “gets scared.” While minor effects were noticed in “forgetful/spacey,” “aggressive toward siblings,” and “disrespect,” medium and even large effects were noticed in “easily offended,” “sad/withdrawn,” and “gets scared.” The largest changes in behavior problems across participants were always associated with top problems considered more internalizing in nature (see Figures 7–8). These results are further supported by the weekly probes of child behavior problems, in which all four participants reported noticeable decreases in child internalizing problems each week yet varied and inconclusive changes in attention and externalizing problems (see Tables 5–7). While some decreases were noticed in externalizing problems, the most significant decreases occurred in child internalizing problems.

Other researchers have found that parental mindfulness and stress reduction training improves child internalizing problems. McGregor et al. (2020) demonstrated that stress reduction in caregivers caused increased non-judgmental awareness in their perspective and decreased internalizing problems in their child. Daundasekara et al. (2021) also found that decreased stress in caregivers moderated decreased internalizing problems in both the caregiver and their child. The meta-analysis by Townshend et al. (2016) demonstrates that increased mindfulness in caregivers is associated with increased emotional wellness in both reports from the caregiver and reports from their child. However, findings from researchers such as Chan and Neece (2018), Lucas-Thompson et al. (2020), and Moreland and Apker (2016), have also found decreased externalizing problems in youth after caregivers underwent stress reduction. Shalev et al. (2020) highlights that parental stress may moderate the severity of autism symptoms; albeit, these symptoms were more related to language development, and caregivers experienced effects while usually engaging in simultaneous behavioral training. It seems that behavioral training can cause decreased stress in caregivers and improved symptoms of autism. Symptoms related to Participant 1's child, who was reported to have external behavior problems related to autism spectrum disorder, increased as caregiver stress decreased. While findings from multiple studies demonstrate an association between decreased stress and decreased child problems of both internalizing and externalizing natures, this study demonstrates that caregiver stress reduction via mindful breathing and without any sort of behavior training was more effective at decreasing youth internalizing problems than externalizing problems.

Fidelity and Social Validity

Participants all rated full completion or near completion of the intervention, and the researchers find no reason to attribute a lack of fidelity to variability across participant findings. Each mother provided relatively high ratings of social validity and described the intervention as being relatively effective, easy to implement, and important to practice in their life. These findings suggest that brief mindfulness recordings may be a feasible intervention for clinicians to provide stressed parents during consolation or other related meetings.

Implications

This study intentionally addressed several problems in the mindfulness literature. Past researchers (e.g., Boekhorst, 2020; Eklund et al., 2016; Goodman et al., 2017; Grossman, 2011; Rayan & Ahmad, 2017; Renshaw, 2020) noted future directions for mindfulness research, which include improving the measurement of mindfulness processes, demonstrating functional relationships that various MBI have on altering specific mindfulness processes, highlighting which mindfulness processes elicit most stress reduction, and clarifying functional relationships between MBI for parents and reductions of their child's behavior problems. This study demonstrated that mothers who spent 5 minutes mindful breathing twice a day for 2 weeks experienced an increase in awareness and decrease in distraction over time. An increase in awareness and decrease in distraction elicited by a practice of mindful breathing was associated with an increase in happiness and decrease in stress over time. This is a step in the direction of empirically demonstrating a causal relationship that simple mindful breathing exercise has on increasing specific mindfulness processes and desired wellbeing outcomes. As seen in the

data, the amount of increased awareness and decreased stress may look different for each caregiver; however, desired changes in processes and outcomes usually ensue when caregivers practice short mindful breathing exercises consistently over time.

It may also be possible that caregiver mindful breathing indirectly reduces child behavior problems that are more internalizing in nature compared to problems that are externalizing or attention-deficit in nature. This study's data specifically suggests that periodic mindful breathing in mothers may be associated with decreased reports of internalizing problems in their child's internalizing problems over time (see Table 3), and the current researchers are unsure if a mother's periodic mindful breathing may be associated with decreased reports of attention- or externalizing-related problems in the child. While this finding necessitates future research to further validate these claims, it may be possible that recommending caregivers utilize MBI at home could be particularly useful for school-based practitioners especially when working with youth who manifest internalizing-related problems at school.

Most important to note is that the researchers successfully demonstrated change in mindfulness levels using a single-case design methodology, which, to the researchers' current knowledge, has been virtually unused as a tool to study change in mindfulness experiences over time. Given that the method proved successful in some domains, there exists promising potential for continuing to increase knowledge and improvement of MBI using a single-case lens. While current MBI have been successfully validated utilizing past nomothetic research, much future knowledge can be gained through examining individual responses to MBI. This study deemed an idiographic method as effective and useful.

Given the brief nature that single-case research must take to be effective, measurement necessitates brief and practical yet informative approach to probing individual responses over time. Past research has yet to develop measures of mindfulness behavior that capture true mindfulness processes with validity, reliability, and precision. While potential flaws existed in the current study's measurement process, the researchers demonstrated sensitive change in certain single-item scales that moved in accordance with mindfulness theory over time. Certain mindfulness processes were successfully demonstrated and validated through use of daily-administered single-item scales, weekly probes, and qualitative descriptions, which demonstrates single-item behavioral reflection as a potentially effective method to measuring mindfulness processes. Future research could potentially utilize similar brief approaches for measurement to answer more focused questions that can aid in improving the predictability of future MBI.

One final strength important to mention is the study's high level of external validity. All instances of interaction, intervention, and measurement were conducted in the caregiver's natural home environment; nothing occurred in a de-contextualized lab setting. Given that the study also demonstrated internal causality between mindfulness, stress, and practicing mindful breathing over time, further confidence is gained in knowing that mindfulness can be an effective form of decreasing stress in caregivers specifically related to contexts that are central to the caregiver's life.

Study Limitations and Future Directions

Given that this study was the first of its kind, exploratory in nature, and high in external validity, some limitations should be considered when interpreting and generalizing results. Most notably is the significant number of variables examined and

the associated difficulty with making causal inferences. While some functional relationships were identified, many questions remain regarding the relationships among mindfulness processes, wellbeing outcomes, and perceptions of child behavior problems. Similarly, the number of variables being examined made baseline stabilization difficult to obtain in all variables across all participants. Future research might focus on specific, causal mechanisms to a greater degree to demonstrate a higher amount of internal validity. Likewise, the limited research on daily, single-item ratings to measure internal thoughts, feelings, and experiences produces a potential internal threat of validity related to measurement error, which can only be addressed in future studies addressing the usefulness of this measurement approach.

Another area of limitation from the exploratory nature of this study is the broad criteria through which subjects were allowed to participate. Experimental control could possibly be demonstrated to a greater degree if inclusion criteria and outcome specification narrowed requirements for specific types of behavior problems, types of stress experienced by caregivers, and/or profiles of certain caregiver characteristics. Furthermore, future mindfulness research necessitates examination of individual responses to MBI specified across other cultures, genders, and nationalities.

A final area of limitation can be found in the type of intervention and method of fidelity measurement chosen for the study. The mindful breathing recording was brief and non-specific in nature to represent the broad nature of MBI in general. Had the researchers chosen a meditation that was longer in length, more didactic in nature, or more focused on attention placement and/or acceptance of specific experiences, it is possible that more participants could experience greater outcome effects or long-term

responses. Additional results could possibly be seen had the researcher communicated with participants more often, offered coaching, and/or re-emphasized certain aspects of effective mindfulness practice more frequently. Use of fidelity self-report may also be a weakness due to potential that self-reports can be inaccurate and biased towards social desirability. While it is unlikely that participants provided untrustworthy statements of fidelity to the intervention (which is due to the nature of how variables changed across participants), it could be possible that participants did not engage in the intervention as instructed nor complete interventions in accordance with what they reported.

Moving forward, research might particularly consider the following action items:

(1) Conduct further validation of single-item rating scales to measure internal mindfulness behaviors. Relatedly is the necessity to further validation of single-item measures specifically capturing behaviors related to acceptance and ignoring. (2) Validate mindfulness processes influenced by other forms of MBI, including mindful body scans, compassionate-based meditations, mindful sensory practices, self-compassion, experiential ACT exercises, etc. (3) Explore and specify individual differences and their causal relationships with responses to MBI over time, including gender, ethnicity, nationality, initial stress level, psychological disorders, age, former exposure to mindfulness practice, etc. (4) Explore differences between child behavior observations given by the caregiver, self-report measures of mental health from the child, and observations by other outside observers such as school teachers, other caregivers, or non-biased researchers. (5) Specify child behavior problems that might be more influenced by caregiver MBI over other child behaviors, such as validating if caregiver MBI truly affects youth internalizing problems greater than externalizing or attention

problems. (6) Demonstrate mechanisms through which increased caregiver mindfulness causes decreased internalizing problems in their child.

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Table 1*Intervention Effect Sizes for Dependent Variables*

Dependent Variable	Participant 1		Participant 2	
	IRD	NAP	IRD	NAP
Mother Mindfulness				
Awareness	0.84**	0.98**	0.76**	0.83*
Distraction	0.84**	0.98**	0.76**	0.88*
Acceptance	0.84**	0.94**	0.29	0.51
Ignore	0.84**	0.97**	0.29	0.41
Mother Wellbeing				
Happiness	0.84**	0.99**	0.40	0.74*
Stress	0.84**	0.98**	0.40	0.80*
Child Problems				
TP 1	0.36	0.38	0.64*	0.89*
TP 2	0.36	0.33	0.52*	0.77*
TP 3	0.36	0.46	0.52*	0.84*
Average	0.36	0.39	0.56*	0.83*

Dependent Variable	Participant 3		Participant 4	
	IRD	NAP	IRD	NAP
Mother Mindfulness				
Awareness	0.41	0.75*	0.69*	0.80*
Distraction	0.71**	0.92*	0.85**	0.90*
Acceptance	0.21	0.41	0.61*	0.86*
Ignore	0.21	0.40	0.77**	0.85*
Mother Wellbeing				
Happiness	0.51*	0.68*	0.38	0.77*
Stress	0.51*	0.76*	0.38	0.66*
Child Problems				
TP 1	0.31	0.57	0.23	0.49
TP 2	0.41	0.75*	0.07	0.28
TP 3	0.41	0.76*	0.30	0.64
Average	0.38	0.69*	0.20	0.47

*medium effect size

**large effect size

Note. IRD = Improvement Rate Difference. NAP = Nonoverlap of All Pairs.

Table 2*Descriptive Statistics for Participants' Daily Ratings Across Phases*

Dependent Variable	Participant 1		Participant 2	
	BL <i>M(SD)</i>	TX <i>M(SD)</i>	BL <i>M(SD)</i>	TX <i>M(SD)</i>
Mother Mindfulness				
Awareness	4.5(1.3)	7.4(0.9)	5.0(1.7)	6.9(1.2)
Distraction	8.8(0.5)	6.0(1.1)	7.3(2.3)	3.9(1.7)
Acceptance	4.0(0.8)	6.8(1.5)	5.2(0.8)	5.4(2.2)
Ignore	9.5(1.0)	5.6(1.7)	5.8(1.5)	6.3(2.3)
Mother Wellbeing				
Happiness	3.8(1.3)	7.1(1.2)	4.2(1.5)	5.5(2.3)
Stress	9.0(1.2)	5.9(0.9)	8.7(1.5)	6.4(2.3)
Child Problems				
TP1	6.3(3.1)	7.6(1.5)	9.3(1.0)	6.6(1.7)
TP2	6.0(2.4)	7.1(1.8)	4.7(1.5)	2.9(2.5)
TP3	8.5(2.4)	9.2(1.0)	4.8(1.8)	2.5(1.8)
Average	6.9(2.5)	8.0(1.2)	6.3(1.3)	4.0(1.6)

Dependent Variable	Participant 3		Participant 4	
	BL <i>M(SD)</i>	TX <i>M(SD)</i>	BL <i>M(SD)</i>	TX <i>M(SD)</i>
Mother Mindfulness				
Awareness	6.1(1.7)	7.7(1.4)	3.4(1.6)	5.1(1.0)
Distraction	6.1(1.4)	3.6(1.1)	6.7(2.1)	2.9(0.9)
Acceptance	5.8(1.7)	5.4(2.6)	3.9(1.3)	5.6(0.8)
Ignore	5.1(1.6)	5.8(2.5)	4.8(2.1)	2.4(0.6)
Mother Wellbeing				
Happiness	5.3(1.3)	5.8(2.1)	6.5(2.8)	8.7(1.8)
Stress	6.8(1.5)	5.1(2.8)	4.3(2.3)	3.2(1.7)
Child Problems				
TP1	4.5(2.2)	3.8(1.1)	3.3(1.2)	3.3(0.9)
TP2	5.6(2.4)	3.7(1.5)	2.3(1.1)	3.5(1.6)
TP3	5.3(3.2)	3.1(2.3)	7.9(2.4)	6.9(2.2)
Average	5.1(2.1)	3.5(1.0)	4.5(1.3)	4.6(0.7)

Note. BL = Baseline Phase. TX = Treatment Phase.

Table 3*Freiburg Mindfulness Inventory Weekly Probes*

Participant	Phase	Score	Average-Item Score	Interpretation
Participant 1	Baseline	25	1.79	Occasionally
	Treatment	31	2.21	Occasionally
	Treatment	39	2.79	Fairly Often
	Treatment	46	3.29	Fairly Often
Participant 2	Baseline	31	2.21	Occasionally
	Treatment	35	2.50	Fairly Often
	Treatment	34	2.43	Occasionally
	Treatment	38	2.71	Fairly Often
Participant 3	Baseline	23	1.64	Rarely
	Baseline	23	1.64	Rarely
	Treatment	32	2.28	Occasionally
	Treatment	33	2.36	Occasionally
Participant 4	Baseline	41	2.93	Fairly Often
	Baseline	47	3.26	Fairly Often
	Treatment	46	3.29	Fairly Often
	Treatment	51	3.64	Almost Always
	Treatment	50	3.57	Almost Always

Note. 14—23 = Rarely Mindful, 23-34 = Occasionally Mindful, 35—49 = Fairly Often Mindful, and 50—54 = Almost Always Mindful. Interpretations are based off average item scores and matched to correlating qualitative responses.

Table 4*Perceived Stress Scale Weekly Probes*

Participant	Phase	Score	Interpretation
Participant 1	Baseline	32	High Stress
	Treatment	19	Moderate Stress
	Treatment	19	Moderate Stress
	Treatment	19	Moderate Stress
Participant 2	Baseline	26	High Stress
	Treatment	19	Moderate Stress
	Treatment	21	Moderate Stress
	Treatment	17	Moderate Stress
Participant 3	Baseline	29	High Stress
	Baseline	26	High Stress
	Treatment	23	Moderate Stress
	Treatment	21	Moderate Stress
Participant 4	Baseline	22	Moderate Stress
	Baseline	14	Moderate Stress
	Treatment	9	Low Stress
	Treatment	8	Low Stress
	Treatment	10	Low Stress

Note. 0—13 = Low Stress, 14—25 = Moderate Stress, and 25—40 = High Stress

Table 5*Pediatric Symptoms Checklist-17 Internalizing Weekly Scores*

Participant	Phase	Score	Interpretation
Participant 1	Baseline	9	Clinical
	Treatment	6	Clinical
	Treatment	5	Clinical
	Treatment	5	Clinical
Participant 2	Baseline	10	Clinical
	Treatment	5	Clinical
	Treatment	5	Clinical
	Treatment	5	Clinical
Participant 3	Baseline	6	Clinical
	Baseline	6	Clinical
	Treatment	4	Non-Clinical
	Treatment	5	Clinical
Participant 4	Baseline	5	Clinical
	Baseline	4	Non-Clinical
	Treatment	0	Non-Clinical
	Treatment	0	Non-Clinical
	Treatment	0	Non-Clinical

Note. Less than 5 = non-clinical score

Table 6*Pediatric Symptoms Checklist-17 Attention Weekly Scores*

Participant	Phase	Score	Interpretation
Participant 1	Baseline	9	Clinical
	Treatment	8	Clinical
	Treatment	9	Clinical
	Treatment	10	Clinical
Participant 2	Baseline	9	Clinical
	Treatment	9	Clinical
	Treatment	9	Clinical
	Treatment	10	Clinical
Participant 3	Baseline	9	Clinical
	Baseline	10	Clinical
	Treatment	8	Clinical
	Treatment	9	Clinical
Participant 4	Baseline	1	Non-Clinical
	Baseline	7	Clinical
	Treatment	4	Non-Clinical
	Treatment	2	Non-Clinical
	Treatment	2	Non-Clinical

Note. Less than 7 = non-clinical score

Table 7*Pediatric Symptoms Checklist-17 Externalizing Weekly Scores*

Participant	Phase	Score	Interpretation
Participant 1	Baseline	8	Clinical
	Treatment	6	Non-Clinical
	Treatment	9	Clinical
	Treatment	6	Non-Clinical
Participant 2	Baseline	5	Non-Clinical
	Treatment	3	Non-Clinical
	Treatment	4	Non-Clinical
	Treatment	4	Non-Clinical
Participant 3	Baseline	10	Clinical
	Baseline	10	Clinical
	Treatment	9	Clinical
	Treatment	8	Clinical
Participant 4	Baseline	1	Non-Clinical
	Baseline	7	Clinical
	Treatment	4	Non-Clinical
	Treatment	2	Non-Clinical
	Treatment	2	Non-Clinical

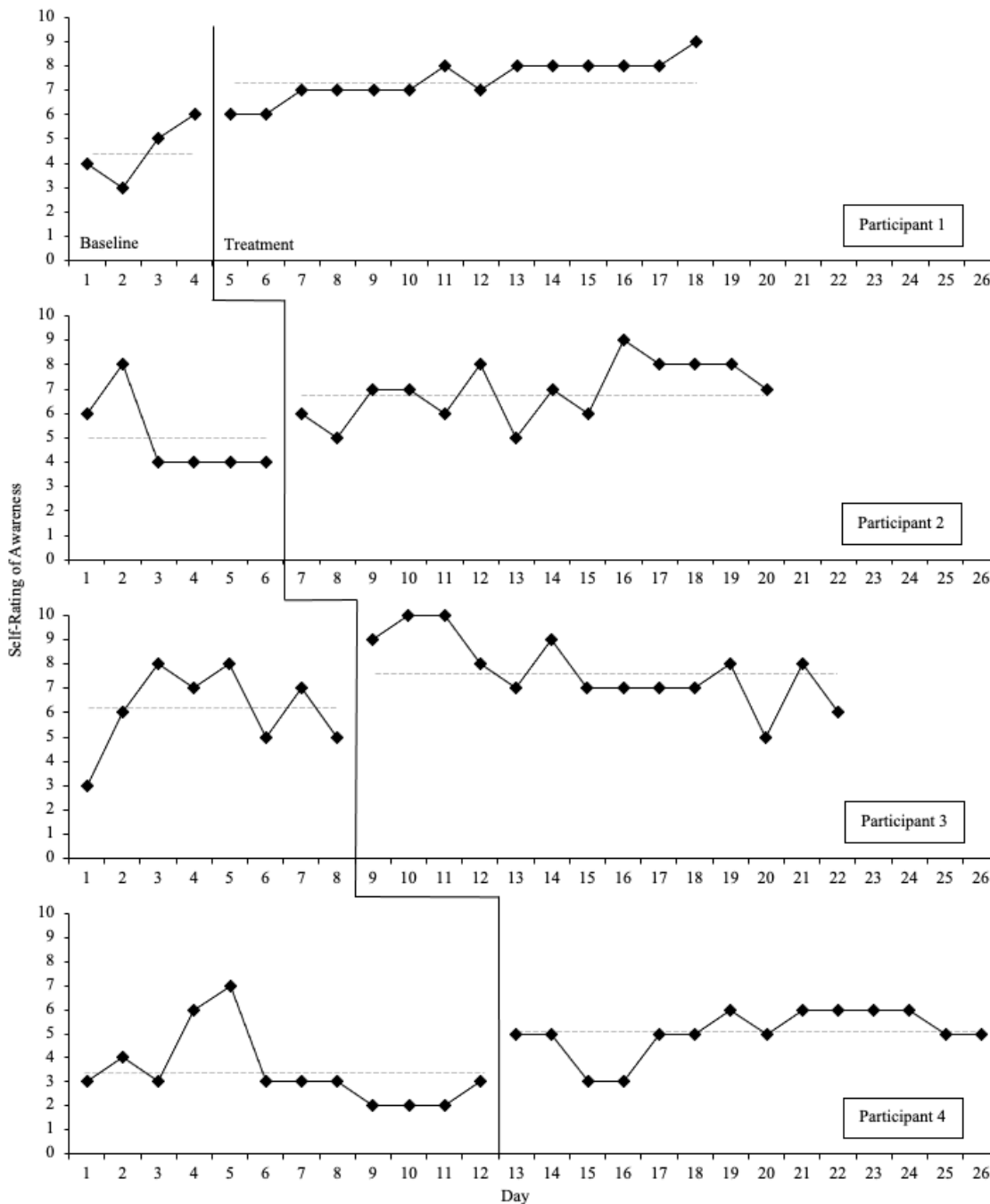
Note. Less than 7 = non-clinical score

Table 8*Pediatric Symptoms Checklist-17 Total Problems Weekly Scores*

Participant	Phase	Score	Interpretation
Participant 1	Baseline	26	Clinical
	Treatment	20	Clinical
	Treatment	23	Clinical
	Treatment	21	Clinical
Participant 2	Baseline	24	Non-Clinical
	Treatment	17	Non-Clinical
	Treatment	18	Non-Clinical
	Treatment	19	Non-Clinical
Participant 3	Baseline	25	Clinical
	Baseline	26	Clinical
	Treatment	21	Clinical
	Treatment	22	Clinical
Participant 4	Baseline	13	Non-Clinical
	Baseline	19	Clinical
	Treatment	8	Non-Clinical
	Treatment	8	Non-Clinical
	Treatment	8	Non-Clinical

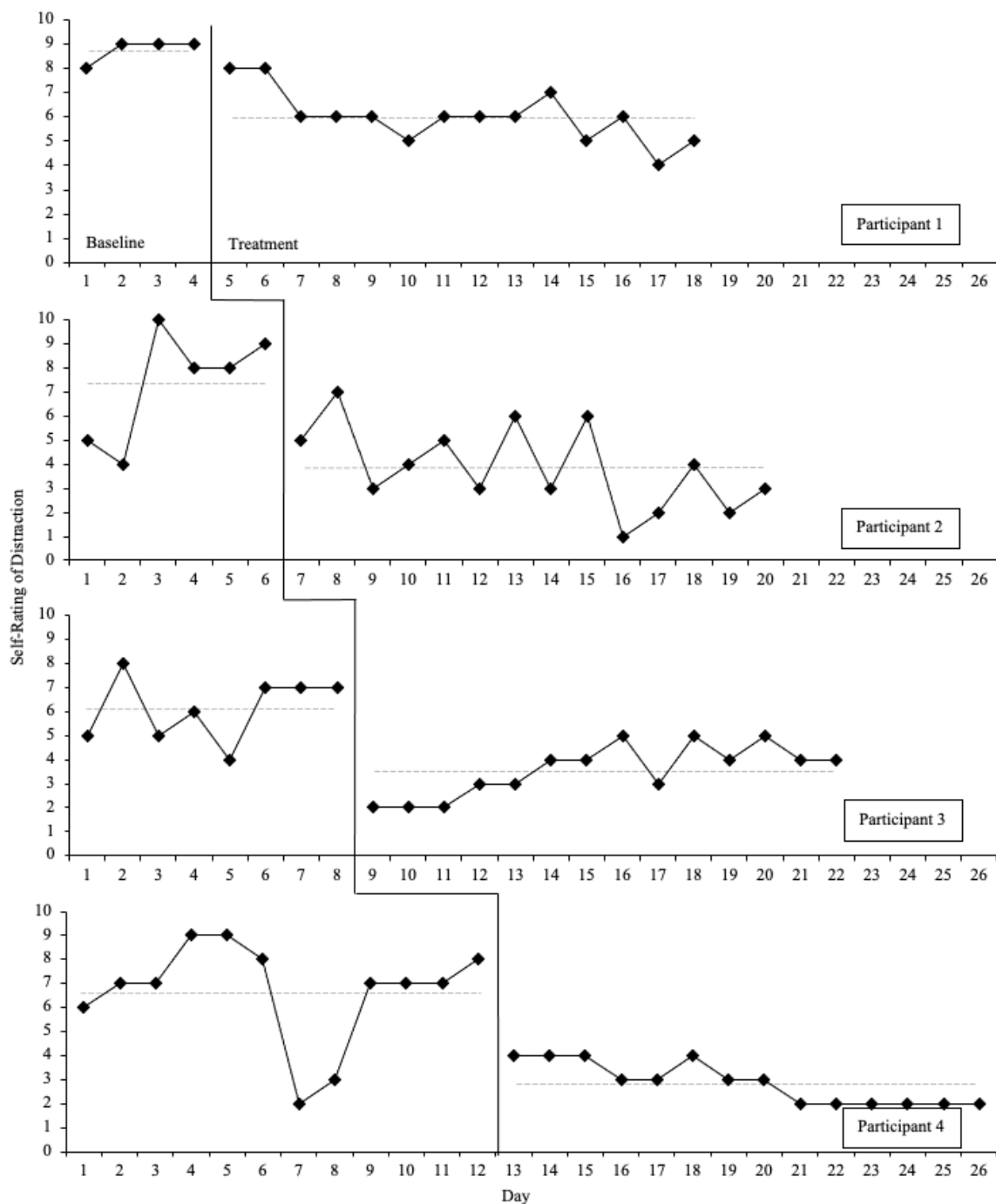
Note. Less than 15 = non-clinical score

Figure 1

Participants' Daily Ratings of Awareness

Note. Dashed lines represent mean trends for all data points within each phase.

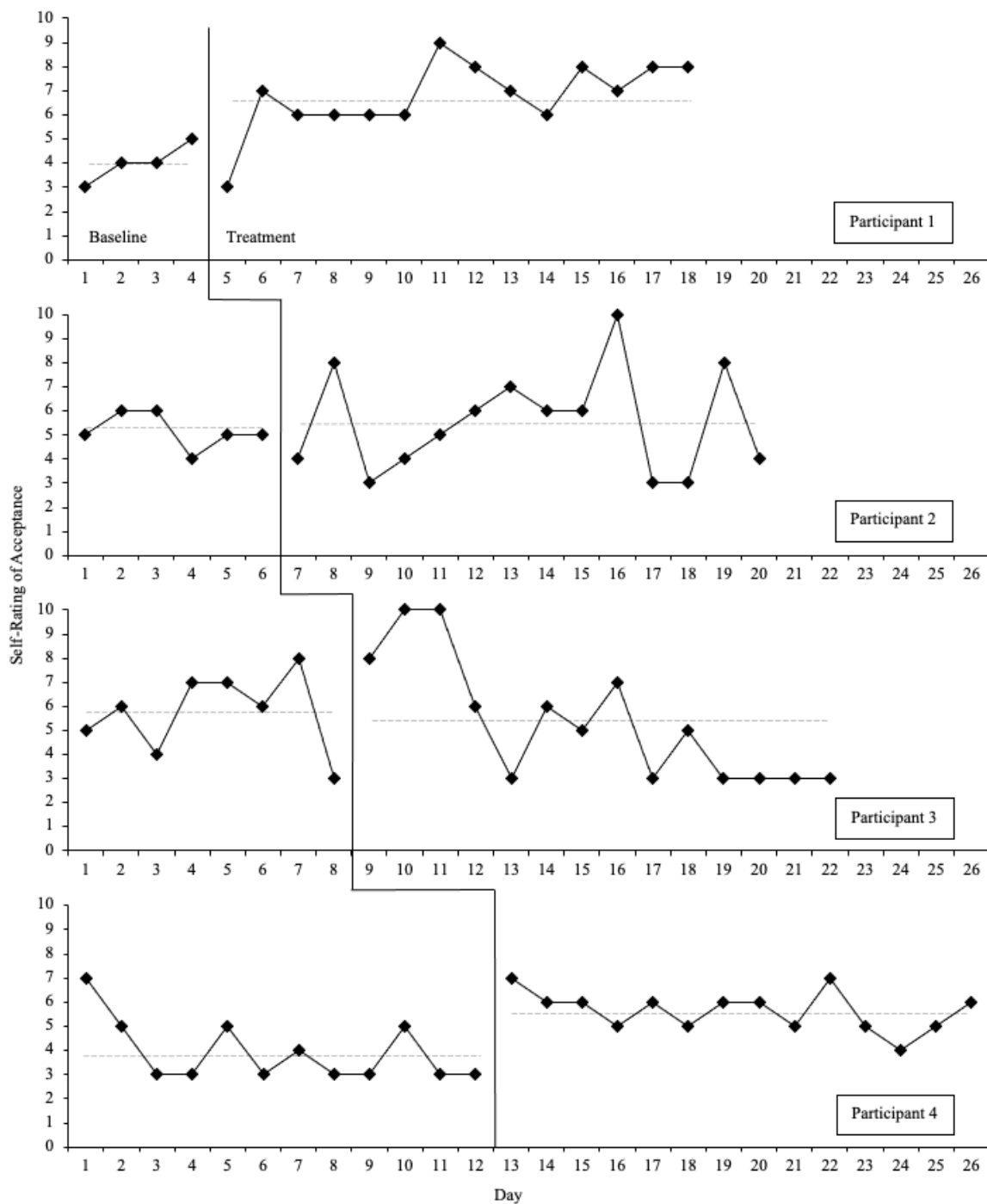
Figure 2

Participants' Daily Ratings of Distraction

Note. Dashed lines represent mean trends for all data points within each phase.

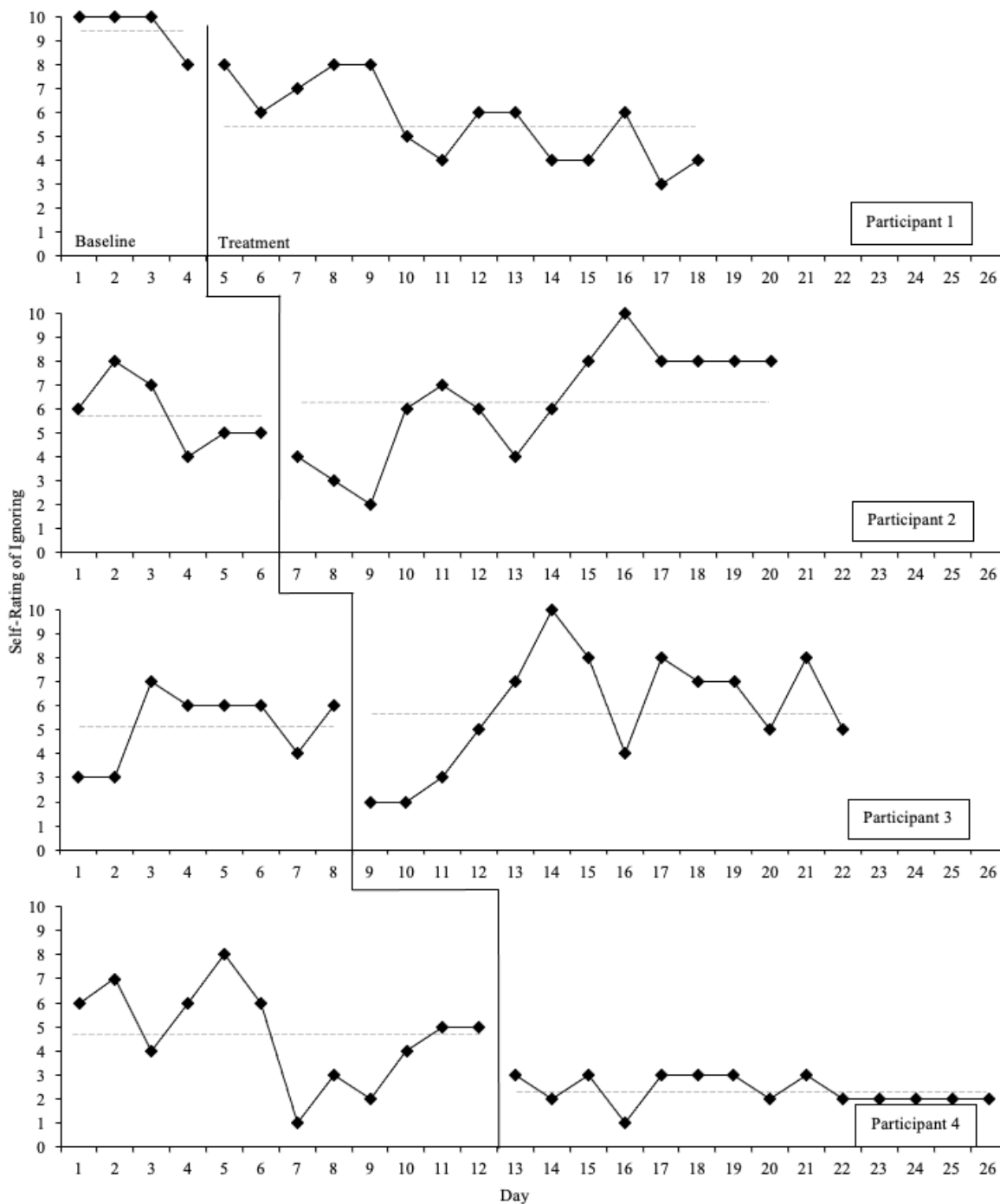
Figure 3

Participants' Daily Ratings of Acceptance



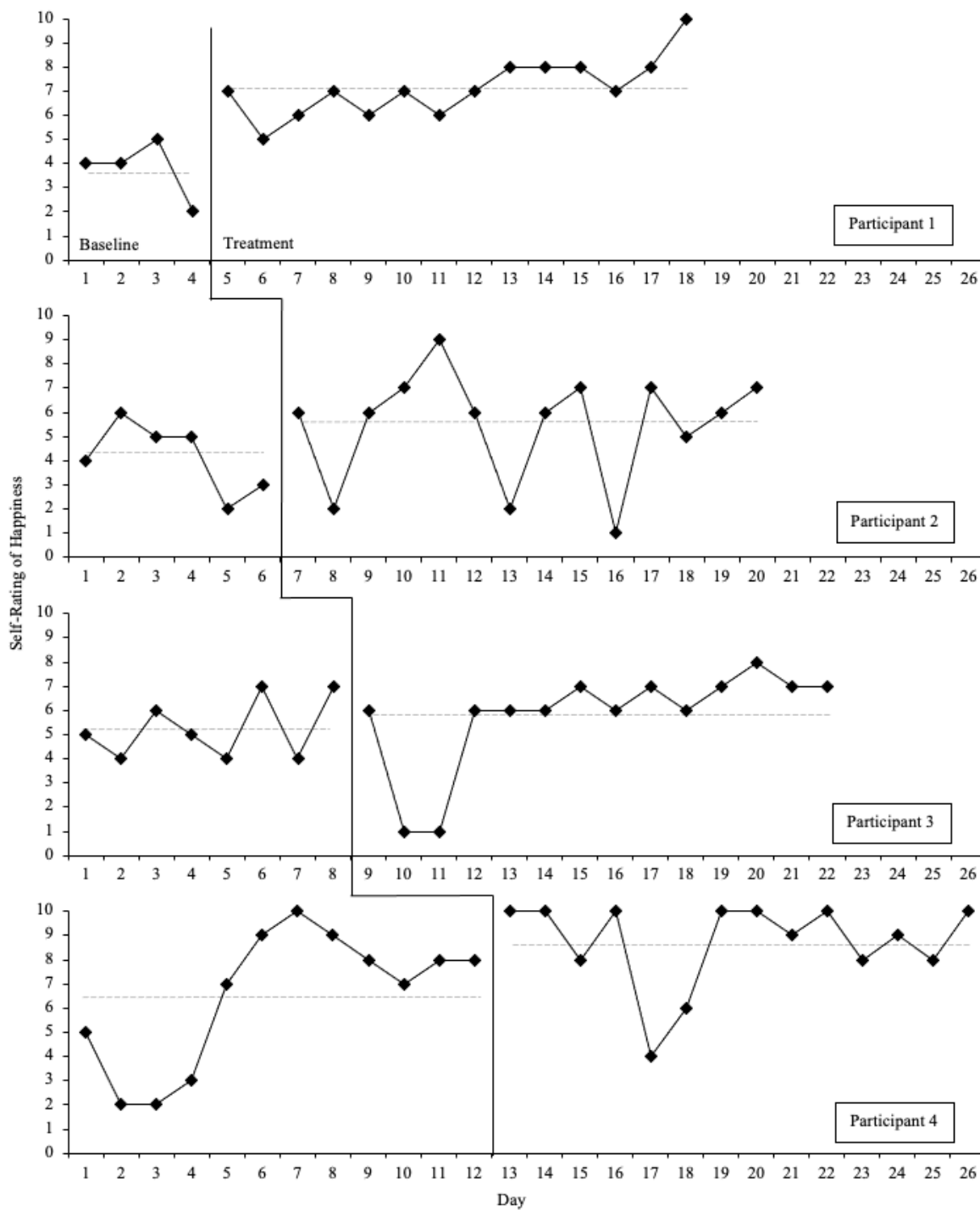
Note. Dashed lines represent mean trends for all data points within each phase.

Figure 4

Participants' Daily Ratings of Ignoring

Note. Dashed lines represent mean trends for all data points within each phase.

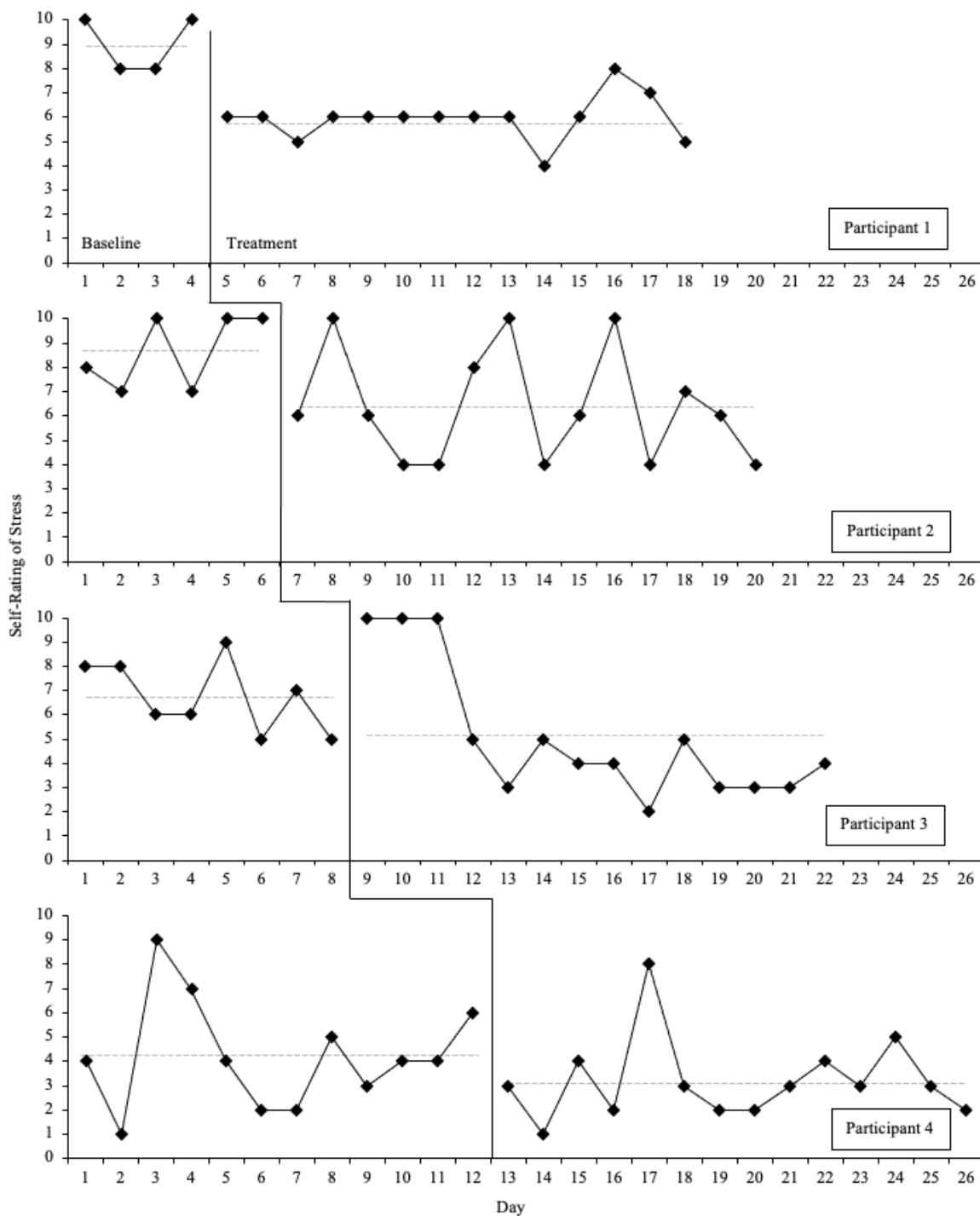
Figure 5

Participants' Daily Ratings of Happiness

Note. Dashed lines represent mean trends for all data points within each phase.

Figure 6

Participants' Daily Ratings of Stress



Note. Dashed lines represent mean trends for all data points within each phase.

Figure 7

Participants' Daily Ratings of Child Top Problems

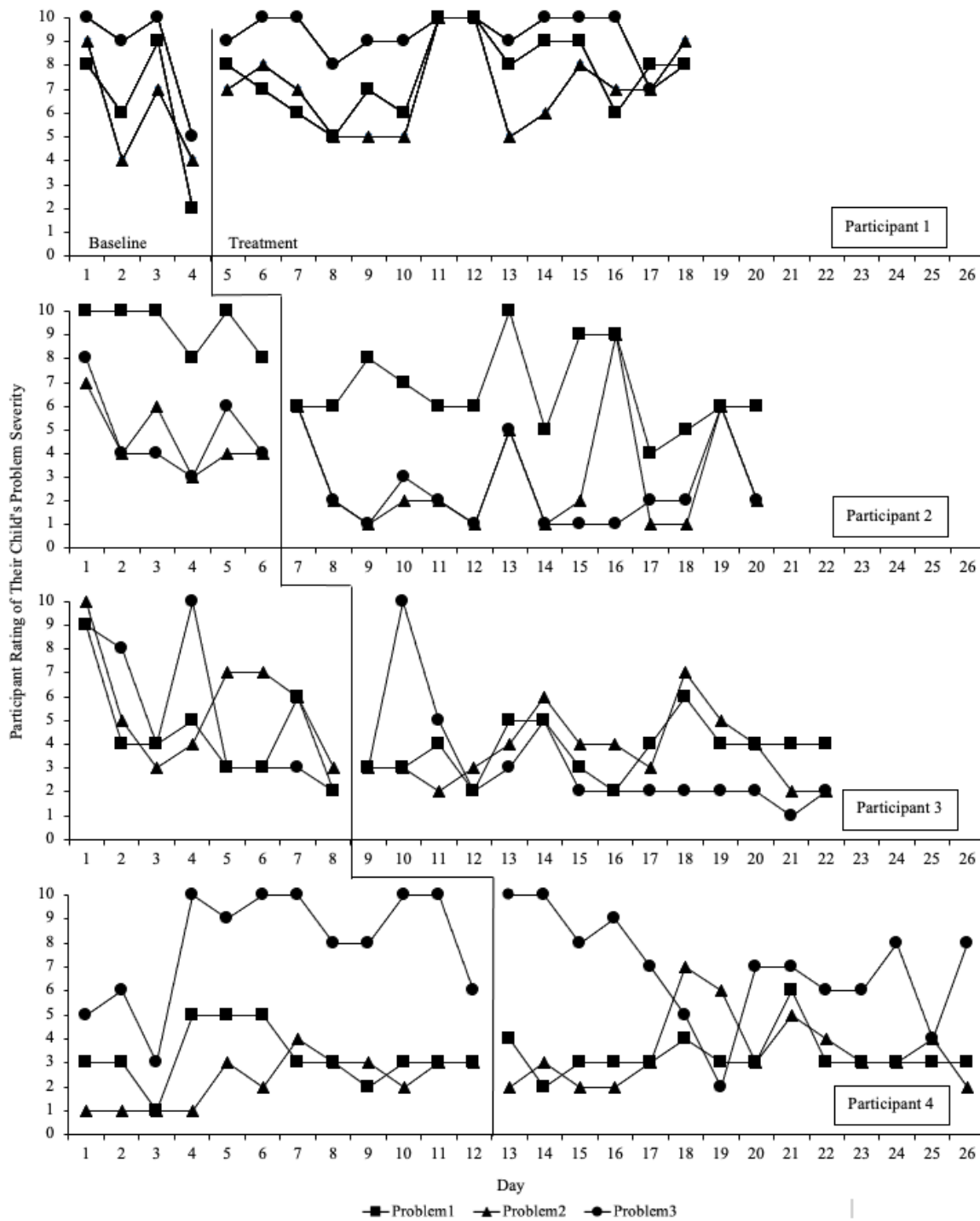
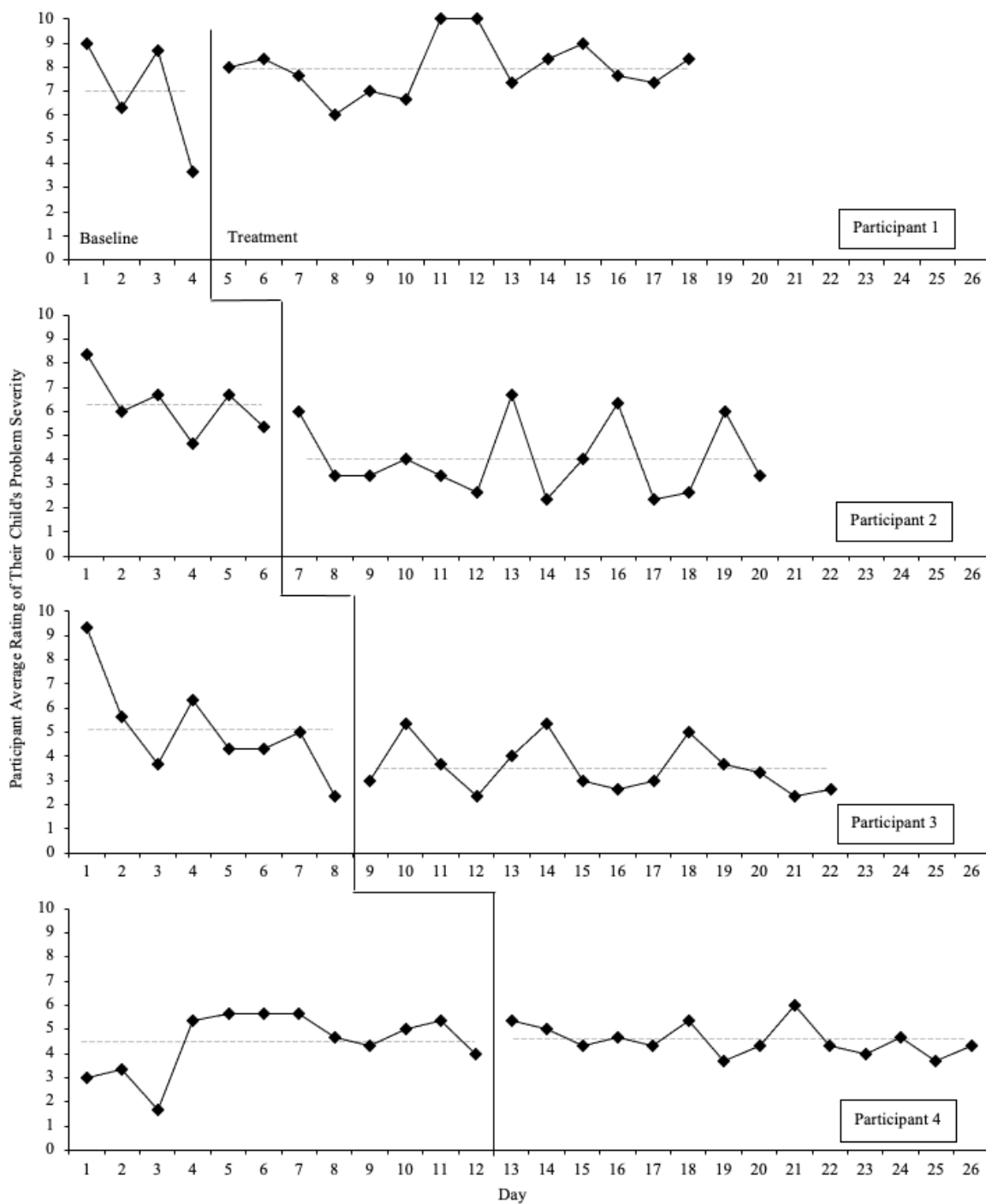


Figure 8

Overall Rating of Participants' Daily Child Top Problem Ratings



Note. Dashed lines represent mean trends for all data points within each phase.